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Diphtheria Immunization in Private Practice

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DIPHTHERIA prevention through mass immunization in public clinics has become so generally accepted as a sound public health procedure that too little attention has been given to the part played by the physician in his family practice. It has been said that these clinics deprived the practicing physicians of the opportunity to carry out such immunization in their practice, inasmuch as the public would not pay the usual office fee for service obtainable free in a public clinic. On the other hand, certain physicians have testified that the conduct of an active diphtheria prevention campaign within a given city stimulated a demand for this service among their clientele. These conflicting views have almost invariably been based on personal opinions, adherents of both doctrines being found in all communities, and neither having anything but the most limited factual data to support the conclusions. In a previous communication * we have given the results of a preliminary study designed to measure the extent to which the public conduct of diphtheria immunization clinics may stimulate a demand for immunization in the private physician's office. In the present paper we have made further and more complete analysis of these data.

Although figures as to immunization clinics are relatively easy to obtain, it is virtually impossible to learn exactly the number of children that may be immunized in private practice. Lacking such information, we have used in this study the amount of toxin-antitoxin in individual doses supplied to the different communities under observation as an index of immunization in private practice.

In Massachusetts toxin-antitoxin is furnished by the State to all boards of health and physicians free of charge. This is supplied in vials of 20 c.c. for clinic purposes, and in packages of three 1 c.c. ampoules for office use by physicians. It has been assumed in this study that the use of these 1 c.c. ampoules has been limited to private practice. This assumption has been checked in certain of the communities using the greatest amounts, and found to be essentially correct. It is entirely reasonable that it should be, owing to

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the time that would be consumed were the individual ampoules used in a clinic. Thus we feel that within reasonable limits the use of such ampoules constitutes a rough index of the extent of immunization in private practice. There is, of course, the possibility that in some instances the large 20 c.c. vials may have been issued for an individual. Although such use has been denied by those boards issuing such supplies to physicians, it would certainly be a rather constant error from one community to another. To ignore such use, if it exists to an appreciable extent, is simply to underestimate the extent of private immunization and therefore to err on the side of conservatism.

Using the above mentioned assumption as a point of departure, we have studied the distribution of these ampoules for the years 1925–1931, inclusive, in all Massachusetts communities above 20,000 population, with the exception of Boston, Pittsfield, and Framingham. The city of Boston was omitted because its position as a center of a large metropolitan area can only mean that many of the ampoules credited to the city will have been used by Boston physicians for the treatment of children from suburban communities. The converse would hardly be true as relatively few Boston children are cared for by physicians with suburban offices. The number of ampoules taken from suburban distributing centers and used in Boston would then be small and fairly constant for all communities. Similarly constant would be the use of toxin-antitoxin ampoules in a community adjacent to that to which it was charged. The city of Pittsfield and the town of Framingham were likewise omitted from the study, due to the impossibility of obtaining sufficiently accurate figures as to immunization clinics.

There remain for study 35 cities and towns with a total population slightly in excess of 2,000,000. The figures used in estimating the extent of immunization in public clinics are those furnished each year by the local board of health or school committee to the State Department of Public Health. The figures of toxin-antitoxin are those of recorded distribution from the State Antitoxin and Vaccine Laboratory at Forest Hills.

For purposes of comparison the average clinic immunization rate for each community for the 7 years under study has been computed, using as a rate the number of children immunized per year per 1,000 population. Relative immunization rate in private practice is calculated as the number of ampoules used per year per 1,000 population. Inasmuch as each child immunized means the use of three ampoules, the actual rate would be determined by dividing the relative rate by 3. The rate based on ampoules rather than on children immunized is preferable inasmuch as the differences between whole numbers can be more readily noted at a glance than differences between fractions, making the trend more easily recognized.

TABLE I

AVERAGE DISTRIBUTION OF TOXIN-ANTITOXIN AMPOULES—ALL COMMUNITIES

Average Clinic Immunization Rate per Year per 1,000 Population	*Average Ampoules T-A-T per Year per 1,000 Population*	*Weighted Average Ampoules T-A-T per Year per 1,000 Population*
Less than 5	4.1	3.0
5–10	6.7	4.7
10–15	7.2	6.8
15–20	7.9	7.2
*20+	8.5	7.0

* Many of these rates are of course in excess of the birth rate. This is possible only during the first few years of an immunization campaign.

In Table I is shown the use of ampoules in communities separated into 5 groups, according to public clinic

immunization rates. The average use of ampoules for the several communities comprising each group is shown in the second column, whereas the third column shows the same figures weighted for differences in population of the communities studied. It will be noted that in those communities immunizing less than 5 children per year per 1,000 population the use of ampoules was at a minimum and that as the clinic immunization rate increased there was a progressive increase in private immunization rates. These differences are particularly striking among the communities with the lower rates.

The figures in Table I are as complete as it is possible to obtain. They include, however, several communities, the immunization figures for which are open to considerable doubt, in many cases being in excess of the number of immunizations obtainable from the quantity of toxin-antitoxin in 20 c.c. vials furnished to them. The discrepancies may be due in part to the inclusion of certain children Schick tested and found negative. This inclusion might be fair if all the communities followed this plan, inasmuch as it represents children reached through the immunization program, but the majority do not include the Schick negatives in their reports. Because of the rather obvious discrepancies in the immunization figures of several communities, it has seemed fair to discard those regarding which there might be reasonable doubt. This leaves a group of 26 cities and towns with a total of over 1,600,000 population. Table II shows the toxin-antitoxin ampoule distribution in these several communities grouped as in Table I according to the intensity of the immunization programs conducted. It is obvious that in these as in the larger unselected group the demand for immunization in the physician's office, as measured by the distribution of the individual toxin-antitoxin ampoules, varies directly with the extent of clinic immunization under official auspices.

It may be pointed out that in the foregoing figures no account has been taken of inevitable wastage of toxin-antitoxin, and that certain communities may have ordered more ampoules than were actually used. This objection is a valid one as it is well known that certain communities over-order all biological supplies to a far greater extent than do others. In Table III an attempt has been made to correct for this wastage.

The immunizations claimed by the several communities have been compared with the amount of toxin-antitoxin furnished for clinic use in 20 c.c. vials. Although each of these vials contains enough material for 6 2/3 complete immunizations, it has been arbitrarily assumed that in clinic practice only 5½ immunizations per vial can be realized. This allows an ample

TABLE II

AVERAGE DISTRIBUTION OF TOXIN-ANTITOXIN AMPOULES—SELECTED COMMUNITIES

Average Clinic Immunization Rate per Year per 1,000 Population	*Average Ampoules T-A-T per Year per 1,000 Population*	*Weighted Average Ampoules T-A-T per Year per 1,000 Population*
Less than 5	4.8	4.1
5–10	7.2	4.8
10–15	7.0	6.2
15–20	7.7	7.1
20+	12.4	10.0

TABLE III

AVERAGE UTILIZATION OF TOXIN-ANTITOXIN AMPOULES—SELECTED COMMUNITIES

Average Clinic Immunization Rate per Year per 1,000 Population	*Average Ampoules T-A-T per Year per 1,000 Population*	*Weighted Average Ampoules T-A-T Used per Year per 1,000 Population*
Less than 5	3.2	3.0
5–10	3.9	2.6
10–15	4.2	3.8
15–20	5.5	5.4
20+	7.3	6.6

margin for the inevitable wastage and has been shown in practice to be reasonable. For example it has been assumed that a community which achieved only 2.75 immunizations per vial supplied has utilized effectively only 50 per cent of the material furnished ($2.75 \div 5.5 = 0.5$). This represents the avoidable wastage due in large part to over-ordering. It is reasonable to assume that a similar wastage has existed with respect to individual ampoules which are used in private practice.

A correction factor measuring the extent of utilization has thus been obtained for each of the selected communities and this factor applied to the number of ampoules supplied to the same community. There has thus been obtained a corrected value for ampoule distribution which probably represents more closely the number of ampoules actually used by the physicians in their private practice. Table III is constructed on the same basis as Tables I and II, except that it utilizes these corrected values. It shows even more strikingly than did the previous tables that the demand for immunization in private practice varies directly with the intensity of the clinic program.

The economic situation in the several communities might logically be thought to be a factor in determining the private immunization rate. Thus it would appear at first glance to be reasonable to suppose that in an economically well-to-do community the demand for immunization in the physician's private office would be greater than in the poorer and strictly industrial city. It might likewise be argued that the better the economic condition of the community the more active a diphtheria immunization program would be conducted and that the private immunization rate was dependent on the former rather than the latter. In Table IV an attempt has been made to evaluate this economic influence. The table shows for the year ending March 31, 1931, the average per capita public welfare expenditures of the communities grouped on the same basis as in Tables I and II. This gives some estimate of the relative economic status of the communities. It is at once apparent from this table that there is no correlation between the relative indigency of the community and the immunization rate. The increase in demand for private immunization demonstrated above cannot, therefore,

TABLE IV

ECONOMIC STATUS OF COMMUNITIES ACCORDING TO CLINIC IMMUNIZATION RATES

Average Clinic Immunization Rate per Year per 1,000 Population	*Per Capita Public Welfare Expenditures*			
	All Communities		*Selected Communities*	
	Crude Average	*Weighted Average*	*Crude Average*	*Weighted Average*
Less than 5	$3.63	$3.74	$3.56	$3.60
5–10	3.83	3.94	3.29	3.70
10–15	3.79	3.67	3.77	3.72
15–20	3.75	4.32	3.99	4.50
20+	3.44	3.41	2.90*	2.59*

* The low figure here is due to an extremely low welfare expenditure in one community which in population exceeded the total of the others in the group. In this city, however, the ampoule distribution and utilization was markedly less than the average for the other communities in the same group. This is not, therefore, inconsistent with the general conclusions that no correlation exists between economic status and immunization rate.

TABLE V

COMPARISON OF IMMUNIZATION RATES AND AMPOULE DISTRIBUTION IN CERTAIN CITIES

	Average Clinic Immunization Rate per Year per 1,000 Population	*Average Ampoules T-A-T Supplied per Year per 1,000 Population*	*Corrected Average Ampoules T-A T Used per Year per 1,000 Population*
Fall River	16.9	9.8	7.5
New Bedford	3.3	2.5	1.5
Cambridge	15.8	5.0	4.5
Somerville *	0.0	1.5	1.0

* In 1932 Somerville has carried on an active clinic immunization campaign. It will be interesting to study its effect on orders for ampoules from this city.

be explained on the supposition that a less indigent population has demanded a greater private service.

In the foregoing tables no attempt has been made to compare individual cities, all communities that were acceptable for study being compared by groups. When we compare communities which are similar except for their immunization programs, the differences in ampoule distribution are brought out very strikingly. This is shown in Table V for two pairs of communities.

Fall River and New Bedford are perhaps the most closely comparable cities in Massachusetts. Situated less than 20 miles apart, they have almost identical populations, both as to size and racial makeup and both present similar industrial and economic problems. Cambridge and Somerville are adjacent cities of comparable size in the Metropolitan area. Although perhaps they are not so similar to one another as the former pair, they are so similar that the difference in the figures in Table V are of considerable significance. The great differences in the extent of immunizations in private practice as measured by the ampoule distribution is hard to explain on any basis other than that the conduct of the public clinics has created a demand for a similar service in the physicians' offices.

Of considerable interest likewise are the figures for the cities of Attleboro and Brookline (Table VI). These are, to the best of our knowledge, the only two of the group studied in which a systematic house-to-house canvass has been made by public health or visiting nurses to urge immunization upon the parents. That they should have shown the highest level of private immunization of any communities studied seems more than mere chance. It might, of course, be objected that Brookline, which is a wealthy suburb of Boston, is hardly a fair selection. The same criticism can certainly not be levelled at Attleboro, which is a strictly industrial community. The conclusion is inescapable that such a program has created an unusual demand for private service even though free service has been obtainable in public clinics.

TABLE VI

COMPARISON OF CLINIC IMMUNIZATION RATES AND AMPOULE DISTRIBUTION IN CERTAIN COMMUNITIES

	Average Clinic Immunization Rate per Year per 1,000 Population	*Average Ampoules T-A-T Supplied per Year per 1,000 Population*	*Corrected Average Ampoules T-A T Used per Year per 1,000 Population*
Attleboro	22.8	22.6	9.9
Brookline	10.6	26.1	15.2

TABLE VII

DIPHTHERIA CASE RATES COMPARED WITH RECORDED IMMUNIZATIONS—ALL COMMUNITIES

Average Clinic Immunization Rate per Year per 1,000 Population	*Diphtheria Case Rates*					
	Crude Average			*Weighted Average*		
	1922–1924	*1929–1931*	*Per Cent Decrease*	*1922–1924*	*1929–1931*	*Per Cent Decrease*
Less than 5	131	105	19.1	145	117	19.3
5–10	193	104	46.0	210	91	56.7
10–15	228	82	64.0	230	93	59.4
15–20	166	54	67.3	198	64	67.7
20+	165	48	70.9	193	39	79.9
State of Massachusetts	207	78	62.3			

Equally significant with the effect of these immunization programs in stimulating a demand for similar service from the family physicians has been the effect on the diphtheria rates. It has been frequently stated that although there could be no doubt as to the value of immunization clinics in preventing diphtheria, statistical evidence on this point was singularly lacking. Some have also advanced the theory that many of the variations listed in the preceding tables might be due to unusual prevalence of diphtheria in the different communities thus creating a demand for private service. In Table VII we have attempted to throw some light upon these two points. Immunization clinics of considerable size began to appear in Massachusetts about 1923 and have been increasing ever since. The diphtheria rate for the years 1922–1924, inclusive, gives, therefore, a fairly accurate measure of the incidence of the disease before immunization had become so extensively practiced as to produce noticeable effects. It also represents the period immediately preceding that covered by the present study. The diphtheria rate for the years 1929–1931, inclusive, represents the situation at the end of the period studied, by which time the effects of the immunization programs should be discernible.

Table VII shows the diphtheria case rates of all the communities grouped as in Table I (35 communities with 2,000,000 population) according to the extent of the immunization programs and the average diphtheria case rates for the two periods.

In Table VIII similar figures are recorded for the selected group of communities studied in Tables II and III.

It is at once apparent that the differences in case rate for the earlier period were entirely fortuitous and determined by chance. They evidently influenced little if at all the relative vigor with which diphtheria immunization programs were to be conducted. On the other hand, the diphtheria case rate for the second period (7 years later) representing the end of this particular study varies directly and strikingly with the intensity of the immunization program. Those cities which have been relatively inactive in providing for diphtheria control through immunization have experienced but slight reduction in case rate, and still are about 50 per cent in excess of the rate for the state at large. Passing from this group through the intermediate groups to that including the cities conducting the most active programs, there is seen a progressive decline in the diphtheria case rate to a level little more than half that for the

TABLE VIII

DIPHTHERIA CASE RATES COMPARED WITH RECORDED IMMUNIZATIONS—SELECTED COMMUNITIES

Average Clinic Immunization Rate per Year per 1,000 Population	*Diphtheria Case Rates*					
	Crude Average			*Weighted Average*		
	1922–1924	*1929–1931*	*Per Cent Decrease*	*1922–1924*	*1929–1931*	*Per Cent Decrease*
Less than 5	133	108	18.8	156	128	17.9
5–10	211	103	51.2	222	94	57.8
10–15	200	78	61.0	197	91	53.9
15–20	187	62	66.8	205	68	66.8
20+	184	46	75.0	187	47	74.8
State of Massachusetts	207	78	62.3			

state. It is hard to draw any conclusion from these figures other than that the diphtheria case rate of the various communities in Massachusetts is directly influenced by the immunization work that has been conducted in clinic and private offices.

COMMENT

In interpreting the foregoing tables it should not be assumed that any one figure has inherent value. At best all of the figures must be mere approximations. Errors may have entered into the recording of children in public clinics. The figures as to private immunization as determined by ampoule distribution are far from precise inasmuch as it is impossible to measure the exact extent to which these ampoules have been utilized. On the other hand, the errors which make these figures little more than approximations are probably fairly constant from one community to another. Inasmuch as the communities are grouped in the various tables the differences in error will to a large degree correct each other. It would certainly be most unreasonable to assume that the errors were all in one direction in communities that had been backward in immunization and in the opposite direction in those that had been active.

Remembering then, that the figures are at best but relative, it is of considerable significance that the trend is so consistent and regular in the various groupings. Table I, which includes all communities over 20,000 (with 3 exceptions noted above) contains the records of several cities and towns which might be challenged. They are included in this tabulation simply to avoid any appearance of so selecting the communities to be studied as to influence the results artificially. It is rather striking that even with the inclusion of these doubtful figures, the trend is so regular and so great.

In the other tables a careful and impartial selection has been made. Only 9 cities and towns have been excluded. The group for study remains so large that the trend which is now even more striking is of unquestionable significance. The same trend is apparent in all the tables. It is the direction and constancy of this trend that is of significance rather than its exact magnitude. The latter will depend on many individual factors and can never be regular for all communities. To the best of our knowledge there is no factor which may have determined this trend other than the different community immunization rates which have formed the basis for the groupings. There appears to be only one explanation for these trends, viz., that the active conduct of a diphtheria immunization clinic program stimulates a demand for such immuni-

zation within the office of the private physician.

It might be supposed that the vast amount of publicity that has been given recently to diphtheria immunization through the newspapers, radio, insurance companies, and magazines for parents would have created such a demand irrespective of a local program. Unquestionably, this has occurred to a slight extent, for during the seven years under study there was a definite though slight increase in demand for private immunization in those communities that have been completely inactive. It is impossible to determine the relative importance of the various factors, or even the extent to which this increase may have been due to an increasing recommendation for immunization by physicians among their patients. These various factors would, however, be constant for all communities, irrespective of the extent of the clinic immunization program. It must be assumed, therefore, that the differences in extent of private office immunization are due to the stimulus attendant upon the conduct of the clinic, and that the stimulus creates a demand on the part of the public for such service in the physician's private office.

Of equal importance with the above considerations are the figures showing the effect of the clinic programs in reducing the diphtheria rate. It is hard to draw conclusions as to the effect of diphtheria immunization by comparison of individual communities. The age distribution of the children immunized, their uneven distribution over the city in question, and many other factors make such comparisons treacherous and uncertain. On the other hand, when a large number of communities, as above, are studied and the average diphtheria and immunization rates are compared, it is evident that diphtheria decreases as immunizations increase.

CONCLUSIONS

1. The active conduct of diphtheria immunization clinics under official auspices creates a demand for immunization in the office of the private physician.

2. The extent of this demand for private immunization varies directly with the intensity of the clinic program.

3. Without an actively conducted program for diphtheria immunization, the public demand for this service is negligible.

4. Within reasonable limits the incidence of diphtheria in a community varies inversely with the intensity of its diphtheria immunization program.

Children's Code in Costa Rica

THE Children's Code of Costa Rica, enacted late in 1932 by the Congress of that country, announces in its opening paragraph that protection of the mother and child is the function of the State. Practically all the provisions of the code are new in the legislation of Costa Rica. A series of measures on maternal welfare is enumerated in the chapter devoted to that subject; among the measures are provisions for the introduction of maternity insurance, the establishment of prenatal centers, and the provision of home care and institutional care for maternity cases. The employment of women in industrial and commercial establishments, public or private, is prohibited by this code for four weeks before and four weeks after childbirth. Women in Government service are given leave with full pay during that time; those in private employment are paid one-half of their wages.

The Tuberculosis Movement Today*

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A BRIEF title to any paper is always an advantage. At the same time it may be misleading. Certainly we are not attempting here a comprehensive or exhaustive analysis of the tuberculosis movement today. Rather, we shall endeavor to point out a few of the more conspicuous features of this program, a few of the principal points of emphasis, with their indications as to how effort may be most promisingly applied in the immediate future. Certain comparisons between the situation today and that of a decade or two ago may also be of significance.

A glance at the tuberculosis program of 15 or 20 years ago, in the light of our interests and objectives today, brings out certain contrasts and certain similarities. In the first place, it is evident that some of the attitudes and slogans of the early period still hold good, though occasionally with a difference in interpretation.

Sixteen or 17 years ago, when the Framingham Tuberculosis Demonstration was initiated, certain experience in connection therewith crystallized in the statement, "The next step in tuberculosis work is the first step, namely, find the cases." To a large extent that is still true today, as evidenced by our Early Diagnosis Campaigns and similar projects. There is, however, some difference in approach. Then, we were mainly in pursuit of the adult, and of the active case, in order to get him into the hands of the physician, to provide a clinical examination, to arrive at a diagnosis and to secure proper treatment. We are now much more interested in and hopeful about tuberculous infection. We are also much more interested in childhood. The basis of our attack has broadened. We are endeavoring to break the tuberculosis chain further back in the chronology of the typical case of disease. We are interested not only in the active case, especially in young adults, and more particularly in females, where the rates are relatively high, but in infection, and in the so-called latent case in childhood, with the earliest signs of invasion.

We have become aware that roughly speaking there are 3 and sometimes 4 principal periods or episodes in the typical case of tuberculosis: infection, latent childhood disease, perhaps reinfection, and active adult disease.

This change in point of view comes about through our acquisition of greater knowledge of the epidemiology of the disease. The science of epidemiology is at last being effectively applied to the problem of tuberculosis. Our point of view concerning the incidence of tuberculous infection has more or less radically changed. There may have been a time in urban populations when tuberculous infection was practically universal, but this can no longer be assumed. It is true that in certain rather selected urban groups its incidence is still high. Hetherington still finds 90 per cent of adolescent school

* Read before the Annual Meeting of the Indiana Tuberculosis Association in Indianapolis, Ind., April, 1933.

children or pre-adults with positive tuberculin tests in Philadelphia. It is believed, however, that a more representative finding is that reported from Massachusetts where the average for many communities among children between 5 and 15 years of age is 28 per cent. Incidentally, when these are examined by X-ray, 5 per cent show some damage, usually slight, and in about 1 per cent this is serious enough to require continued medical attention. Instances of the opposite extreme in positive tuberculin findings are reported by Broker, in Minnesota, where only 1 in 160 girls and boys was positive, and by McCain, in North Carolina, where only 4 per cent were positive. It may be remembered that in 1917 in Framingham a group of younger-aged school children showed 33 per cent with positive tuberculin reactions. Ten or 12 years later, after the Demonstration, a considerably older school age group showed only 18 per cent positive. These two sets of tests were sufficiently similar in technic to be legitimately compared, even though differences in method may in part account for some of the wider variations among recent findings cited. It would therefore appear that the prevalence of tuberculous infection is diminishing and that it is controllable. It is no longer necessary to assume that infection is inevitable. It is possible to find the foci of infection, whether human or animal. It is worthwhile, therefore, to stress the point that every tuberculosis case comes from another. The search for family foci in particular is profitable. The examination of contacts is advantageous both from the angle of discovering a source of infection and also from that of disclosing possible channels for further dissemination.

All of this represents a rather striking change in point of view—a new attitude that is perhaps the principal feature of the tuberculosis movement today. The discovery of the child in tuberculosis promises to be a very great contribution, not only to the welfare of children but also to the problem of tuberculosis control at large. This approach has stressed the intensive use of relatively new instruments in the wholesale search for the disease. Fluoroscopy as a screening process, and the use of the tuberculin test with the X-ray have very advantageously supplemented the older clinical procedures. The use of these diagnostic devices tends to become universal among the younger age groups, only the question of cost standing in the way. Here the situation is promising. Experiments are indicating the feasibility of these procedures on a large scale. For instance, the Queensboro Tuberculosis Association in New York, with the coöperation and financial aid of the Metropolitan Life Insurance Company, has been experimenting with the Powers portable rapid X-ray camera and paper films, demonstrating the possibility of making as many as 1,000 chest exposures in a day, at a per capita cost somewhere in the neighborhood of $.75, including the expense of interpretation. Experiments elsewhere indicate a cost possibly as low as $.40. In normal times many communities would not find this too great a burden to add to the routine school health and medical examination procedures.

It is true that there is as yet no universal acceptance of the significance of so-called latent tuberculosis in childhood, as to its hygienic or therapeutic indications in all cases; yet on the whole the outlining and defining of this phase of the manifestation of tuberculosis seem to represent a big advance in our concept of the disease and in our methods of detection and control.

In the meantime, while human foci have been more and more frequently detected and eliminated, much progress has also been made toward the elimina-

tion of animal foci and the control of the hazards of tuberculous milk. It is well to realize the progress made in these directions and the necessity for maintaining the position now held. A relaxation in our efforts at control may be costly. One cannot but experience misgivings when one notes serious curtailments, for instance, in appropriations for health department epidemiological activities, or for institutional care of open cases of the disease. It is not reassuring to read of the organized opposition to the tuberculin testing of cattle in Iowa and elsewhere. We are here faced with the dangers of losing the advantages gained in the past, and of restoring certain of the largely eliminated hazards of childhood. There might also readily be incurred serious economic consequences to individuals and families, to the cattle and dairy industries, and to our communities generally.

Still in the general field of epidemiology, it is regrettable to note that while great steps in advance have been taken along the above mentioned lines, little progress has been made toward the artificial immunization of humans against this disease. The Calmette vaccine is, of course, being widely experimented with. Certain observations reported by foreign experimenters seem promising but are accepted with reservations here. European statistics concerning the effectiveness of the vaccine are viewed with doubt by statistical authorities in this country. Perhaps the most basic work in the field is being done by Park in New York, with the coöperation of the Metropolitan Life Insurance Company and other agencies. Here the vaccine is being used with careful controls, and with results that are considered encouraging. However, most authorities feel very definitely that this procedure occupies a controversial position and cannot as yet be endorsed for routine or wholesale application.

On the other hand, more strictly in the field of treatment, but of public health as well as therapeutic significance, it is very encouraging to note the increasing success with which the lung collapse, rib resection, and other forms of thoracoplasty are being employed—procedures that with increasing frequency are proving advantageous to the patient, as well as helpful in decreasing human foci of infection. These certainly represent outstanding advances in treatment methods of the present and recent past, and may be of sufficient significance to account in part for the continued improvement in tuberculosis mortality.

This suggestion seems to be borne out by available records. As is well known, in the treatment of advanced cases with extensive cavitation prior to the days of thoracic surgery, the early mortality following diagnosis was extremely discouraging. In a study by Sprungmann, based on 626 cases, there was found a total mortality of 78.2 per cent in 16 years, and a death rate of 61.7 per cent in the first 2 years. Barnes and Barnes, in 1,450 cases, found a mortality of 80 per cent within 1 year, and 90 per cent within 5 years. In contrast to this, as Fischel recently pointed out, a study by Neuberger based on cases treated with thoracic surgery indicates that after 1 to 5 years, over 61 per cent had regained and retained their working and earning capacity, and only 17 per cent had died, the remaining being in the incapacitated group. Chadwick, from the experience of the Herman Kiefer Hospital in Detroit, referring to the period 1929 to 1932, states that "The number discharged with favorable results has increased from 45 per cent to 69.8 per cent, and the number of deaths has decreased from 25 per cent to 6.5 per cent. The marked reduction of deaths and the improvement in discharged patients have been due in a large

measure to the general use of collapse therapy." When one realizes the increasing extent to which this great contribution to tuberculosis therapy is being applied by institutions throughout the land, the above assumption concerning its probable relationship to mortality seems justified.

On the statistical side we are all aware of the progress that has been made as measured by the death rate from tuberculosis. With the disease now ranking 7th or 8th, we have come a long distance since the time when it occupied the first position as cause of death. However, it must be recognized that mortality is by no means a complete measure of the situation. Furthermore, deaths at all ages are sometimes not as significant as deaths in particular age groups, as has been frequently pointed out. This is especially true of tuberculosis, which still stands first as the cause of mortality and disability in the productive period of life from 20 to 40 years. Nevertheless, the mortality rate presents a gratifying picture. Among Metropolitan industrial policy holders, who constitute a group of many millions, the death rate for 1932 reached 70.1 per 100,000, contrasted with 114.2 in 1922, and 224.6 in 1911. This improvement in 1932 seems to have been characteristic for the country at large, so far as records are available. Here in Indiana, with the rate of 88.1 in 1922, and 61.1 in 1931, the rate was 59.9 in 1932, which represents 16 fewer deaths than in 1931. In the Metropolitan experience the drop in 1932 is 8.6 per cent under the previous year, which is the biggest percentage annual decline in a decade. Thus far, 1933 seems to be reflecting this downward trend, the cumulative rate to date being 66 as compared with 69.2 in 1932. There seems to be no reason as yet to doubt Dublin's earlier forecast of a rate of 40 for Metropolitan industrial policy holders by 1939, and a rate that may fall between 28 and 37 per 100,000 for the original registration states by that year.

On all hands considerable surprise has been expressed that there has been thus far no effect upon the death rate coincident with the depression. While this is evidently a fact, of course no one can yet estimate the ultimate effects of the depression, and no one can say what may or may not follow the underfeeding and malnutrition and other physical and mental characteristics of the depression period, especially as they bear upon childhood. Certainly undernutrition is by no means negligible, as shown by the fact that in New York City alone, in 1932, 32 deaths were reported by the Division of Medical Records as resulting from starvation, including no cases of refusal to eat, inability to eat, or cases of deficiency disease. The prospects are considered by many to be disturbing, yet thus far, in addition to the mortality picture, there have been reported no very significant or definite signs of an increase in the incidence of latent or active tuberculosis in any age group.

Indeed, 1932 was the best year thus far in the general mortality experience of Metropolitan industrial policy holders, and probably also of the population at large. It seems probable that a combination of circumstances may be responsible for this favorable situation. In the first place, health departments and voluntary health agencies have operated effectively, even with curtailed resources. In the second place, relief, even though on a minimum basis in many communities, has nevertheless been organized and administered with thoroughness. In the third place, our public at large was fairly well informed concerning disease prevention and health conservation, and has drawn upon the reserve of education built up

in the pre-depression years, contributed to by public and private agencies alike. Finally, and perhaps most important, climatic and epidemic conditions were most favorable during 1932. In particular, we were relatively free from outbreaks of acute respiratory disease, particularly influenza. When influenza and pneumonia incidence and mortality are low, deaths from other causes, including tuberculosis, tend to remain at a minimum. By way of contrast, we have the experience of 1918, and indeed the minor influenza outbreak in the early part of 1933, when deaths from many causes showed a tendency to increase, although, fortunately, this set of circumstances in this latter instance has appeared not to have affected the tuberculosis mortality to a serious degree.

Looking back over the remarkable decline in tuberculosis mortality in the last several decades, it must of course be admitted that many forces and factors have been at work, including economic and social improvement, general sanitation, occupational hygiene, etc. Nevertheless it has been definitely established that the antituberculosis campaign in which we have all been engaged has contributed materially to this very concrete accomplishment. There is every reason to hope that the campaign, if continued along present lines, with such modifications in emphasis as new knowledge and circumstances may dictate, will lead us—providing we meet with no serious setback such as might be associated with the sequelae of the depression—to man's ultimate conquest of tuberculosis that will place this disease, alongside of typhoid fever, yellow fever, and diphtheria, in the museum of fast disappearing causes of death.

Hopeful signs that augur well for the future are the coöperation of forces and the integration of effort that seem to be more and more characteristic of our general health program. There is, I believe, a greater mutual understanding of aims, and mutual aid between health and medical organizations than ever before. This applies to tuberculosis associations, to physicians, to health officers, and to civic and industrial units. The leadership of health authorities is becoming more conscious, more liberal and more constructive. Our present joint efforts to maintain appropriations and personnel for public health work are an encouraging sign of the times. In addition, as stated above, the public is better informed than ever before, as a result of the activity of such organizations as the Indiana Tuberculosis Association.

All this leads us to hope that in spite of the present serious handicaps, we may be successful in holding the gains of the past, in experiencing only a temporary curtailment in our resources, and in making a wisely balanced use of such facilities as we now have for the promotion of the most essential services. We can also hope to see the most effective integration of the tuberculosis movement into the general health program, recognizing its relation to administration, to sanitation, to education regarding nutrition, health examinations, and similar health promotive activities in the field of personal hygiene. The realization of those hopes, in which I know you all share, will carry forward the control of tuberculosis to a triumphant termination.

Smoke Abatement at Low Cost*

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HEALTH activities are no more immune from amputation than are the municipal markets or the ornate fleets of limousines. Old services fight to endure. New services are whispered about behind closed doors and then pigeonholed to await a more auspicious day of birth. It is in such a world of indefinite values that the infant, Smoke Abatement, finds itself.

The whole problem of air hygiene is comparatively new in civic progress. The cities that have pioneered in smoke abatement have merely scratched the surface of the difficult task. In many cases, smoke abatement laws were enacted during the days of municipal munificence, and even then enforcement of the new regulations was made impossible because of lack of organization. In the present financial stress, a new service like smoke abatement is likely to fare poorly. Many cities now engaged in atmospheric cleansing will find themselves with the vehicle of air hygiene and no motive power, while for those proposing the inauguration of smoke abatement campaigns, there is discouragement ahead.

Even the most ardent proponent of smoke abatement will admit that the most rigid anti-smoke ordinance, the most intelligent boiler installation control, and the most vigilant smoke detection cannot produce an unhazed skyline. What is first needed is a smoke-conscious citizenry. To whom does smoke abatement appeal? The general public? They can get little satisfaction from the statistical fact that their city's smoke costs each citizen $15 a year, when they know that every dollar they have had in the past year has gone for food and clothing—the bare necessities of life. The merchant? The argument that smoke ruins his merchandise falls upon deaf ears when he realizes that business is poor and the most frequented spot in his shop is the bargain counter of soiled goods. The property owner? While the smoke official recounts the sooting effects of smoke and the destructive action of stack fumes, he is mentally computing his tax bill and wondering where he can raise the money to pay it. The ultra-violet ray addict? He is too busy basking in the radiance of his sunshine lamp and eating irradiated foods to worry about the sun-robbing effects of smoke.

Who else? The building superintendent? While he listens to the scientist explain that smoke means poor combustion and money wasted, he is deciding to buy a cheaper grade of fuel and use the porter for fire stoking, thus enabling him to discharge the expensive fireman. The civic leader? Talk to him about the dangers of the smoking factory stack and he raises his hands heavenward and fervently prays for more smoking industries.

This is rather a pessimistic picture for a smoke abatement proponent to paint. Fortunately, the pitfalls have been exaggerated for the sake of emphasis.

Smoke abatement efforts must not

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cease, even in the face of depleted budgets. There are certain services which must be provided whether the public wills it or not. Smoke abatement is one, though it is less recognized as a health policy than are the others which control environmental conditions. A let-down in this work may destroy much of the progress made by the pioneers. It is the duty of existing agencies to keep going, somehow, some way, until financial conditions permit other cities to take up the work. Now is the time for all sanitarians to talk price; bargains in smoke abatement will become mighty popular.

SCHENECTADY PLAN

It is interesting to review the smoke abatement policy of Schenectady, N. Y. The control methods and accomplishments of that community's campaign are worthy of attention, not as examples of what a good smoke abatement program should be but what it has to be to meet present financial conditions.

Schenectady, a manufacturing city of 97,000, has regulated its growth in accordance with a zoning code since 1927. In setting forth the areas available for certain types of commercial and industrial activity, the zoning law designated 3 zones of unrestricted manufacture, these being in the areas occupied by the General Electric Company and the American Locomotive Company, the two leading industries.

The original smoke ordinance went into effect in 1927. It contained all of the approved provisions. Smoke of greater density than No. 3 on the Ringelmann chart was not permitted for more than 75 seconds of any one hour, except when fires were being started or cleaned. A 6-minute smoke production was permitted per hour under such conditions. The 3 zones of unrestricted manufacture were designated as zones of unrestricted smoke, no control being maintained over the industries. Smoke was restricted from all structures, tugs, locomotives, rollers, etc., but smoke from any residence was not a violation of the law. The Bureau of Engineering was designated as the enforcing agency. Smoke production became a misdemeanor subject to fines of from $10 to $100, each day of smoke production being a separate violation. Permits were required for the installation of new boiler equipment or major repairs to existing units.

For a period of a year and a half, Schenectady found itself with a cumbersome ordinance, difficult to enforce in its entirety, and without a staff to serve as the enforcing agency. One man, a heating engineer, was charged with the task of reviewing plans for boiler installations, inspecting installations for conformity with the plans, issuing permits, and observing smoke violations. In his spare time he designed the heating and ventilation systems for a rather extensive group of city buildings then under construction. Even sweet Charity could class this type of smoke abatement as nothing more than a low-class activity at low cost.

In 1928, a simplified abatement ordinance was adopted, the old one being retired from the books. It made no provision for control over boiler installations or repairs. Smoke from residences was brought under control and all other smoke provisions of the old ordinance were retained.

It is characteristic of the general bargain-hunting spirit that the enforcement of the new ordinance was again delegated to one man, the writer, who served as engineer of sewage treatment and director of the city's material testing laboratory, and utility man on general municipal sanitation problems. Located at the treatment works—and all sanitarians know where that is in relation to the business district—the smoke abatement official was in a

poor position to act as a smoke spotter. The work consisted of investigation of specific smoke complaints, observation of points of potential smoke production as time permitted, and a slow methodical all-city survey of stacks that was planned to take 6 months. A program of friendly contacts with smoke violators was inaugurated although little time was available for the study of troublesome installations for the purpose of improving combustion.

In this campaign of hit-or-miss smoke control, some improvement was noted. What benefits were reaped, however, were neutralized by the general dissatisfaction produced by the sporadic activities. The one-man campaign was filled with embarrassments for the municipality. A call upon the owner of a smoking stack was certain to end in a denunciation of a policy that attacked his humble building and left dozens of others to go scot-free. Each violator could enumerate an imposing group of other violators; it was impossible to obtain coöperation under such conditions. Furthermore, persistent complaints from some neighborhoods could not be verified by the inspector in the short periods he could devote to the nerve-racking job of watchful waiting. It became whispered about among a group of disgruntled housewives that the inspector was in league with the owner of a troublesome laundry and that no smoke would ever appear until the official took his leave. This group took pictures of the smoke from this stack and presented the evidence to the writer with ill-concealed sarcasm.

Here is a lesson for any community that proposes to set up a one-man organization to control smoke, unless that man becomes a mere spotter located in a crow's-nest with field glasses trained upon the sky-line. No active campaign can be waged until the smoke abatement organization comes out into the open to wage battle and offer assistance to property owners. It can be established as an axiom of smoke abatement that "the more visible the staff, the more invisible the smoke."

It became evident in Schenectady that smoke abatement would die a well-wished death unless violators were assured that stack control was universal rather than individual. This required an increased staff. Even in the more generous days of 1930, no funds for this purpose were forthcoming. It was found, however, that the Fire Prevention Division of the Fire Department was doing work akin to smoke abatement. The inspectors of this division were checking up on oil burners and were often instrumental in obtaining stack extensions made in the interests of safety.

An appeal to the Commissioner of Public Safety met with willingness that the Fire Prevention inspectors should assist in the smoke abatement program in the capacity of smoke inspectors. At one stroke, a non-technical inspection force became available at no cost to the city. This group, while unversed in smoke abatement procedure, was especially well trained in city inspection work. The unit consisted of a fire marshal, an assistant fire marshal, a chief inspector and 6 inspectors. These men had been chosen from the Fire Department when the division was formed. The city had been divided into 6 districts ranging in size from small areas in the congested business section to larger areas in the outlying sections. One inspector was put in charge of each district, the business and secondary business territories being covered by the inspector daily and the residential sections every 2 to 4 days, depending on the locations. Each inspector knew his territory "like a book," and knew likewise the owners of the principal business and commercial establishments like the characters in that book.

Here was an inspection force that with proper training could be made into a splendid smoke detection staff. A course of instruction was arranged. At a series of informal chats, the firemen were informed about the dangers of smoke, the abatement activities of other cities, and what could be expected in their own city. A non-technical explanation of the theory of combustion was also presented. A special effort was made to show the relation between the improper combustion conditions that produce smoke and fire hazards. The men were taught to gauge smoke densities by means of the Ringelmann chart and every opportunity was taken to point out smoke from the windows of the lecture room and have the men guess its color density. A splendid picture of a No. 3 smoke was duplicated and a copy mounted in a pocket folder presented to each inspector for use during the training period.

The men were sent out for a probationary period of smoke observation, during which they made notations of all smoke observed, regardless of density or period of duration. The men entered upon the work with vim and derived great pleasure from their new accomplishments. Within a short time the firemen were sufficiently acquainted with their tasks to warrant placing them on the streets as official smoke inspectors. For almost 2 years, these men have vigilantly observed all smoke violations in the city. They have done their work well; it is a mighty infrequent smoke plume that gets by the inspectors.

All smoke violations are recorded on small report forms of file-card size which are turned in to the fire marshal each day. The firemen are instructed to call the attention of each violator, as quickly as possible after the smoke is observed, and to urge remedial measures. No technical advice is offered. If the property owner asks for advice, the case is referred to the engineer who calls upon the owner and makes suggestions for improved combustion. Where possible, the firemen or the chief inspector is in attendance at this time and he attempts to check up, during subsequent inspections, to determine if the advice is being followed.

Weekly conferences are held during the heating season, at which the engineer and the inspectors discuss the findings of the previous week. If any inspector has experienced trouble with a violator, the case is discussed. It is interesting to note that other inspectors usually know the individual and something of his property and can offer suggestions on how the person can best be handled. Letters are frequently addressed to such violators, suggesting in a friendly vein that steps be taken immediately to correct the smoke violation. A copy of the smoke law is attached. Similar letters are sent to those violators not visited by the inspectors.

Several innovations have been introduced in Schenectady for the purpose of making possible the low cost control. The city has made an appeal to all coal dealers handling bituminous coal to supply their customers with the lowest volatile fuel consistent with their price limitations and combustion conditions. Several installations have changed from bituminous to small-size anthracite coal as a result of this activity. Others have changed to non-smoking types of bituminous fuel, and smoke conditions have improved as if by magic.

A coöperative campaign was waged by the city and the fuel economy officials of the two railroads that serve the community. One line went to the expense of posting notices of Schenectady smoke regulations at their division points and having their locomotive inspectors obtain the signature of each engineer and fireman to a statement that they had seen the notices.

Several careless firemen and their engineers were called before the superintendent and reprimanded. As a result, the locomotive that stands at the station and paints the city with a bituminous brush is the exception.

No control is maintained over the installation of new or the repair of old fuel burning equipment. The Schenectady policy has been, "If the stack is right the boiler must be right." Discontinuing this control with the enactment of the new smoke ordinance has made enforcement much simpler. At the same time, it has removed but little of that valuable regulation which the city previously had over the equipment that was to make smoke in the future. In the case of Schenectady, little new boiler work was being carried out and that being done was a small portion of the total fuel burning equipment in the city. Since no control was possible over existing equipment, the loss of control over new units was not a serious matter. More important, however, is the fact that the city has maintained an invisible control over new boiler work, without actually seeming to do so. It has become customary for property owners, architects, and contractors to require the boiler manufacturers to guarantee that their equipment would comply with the existing smoke law. Requests for copies of our ordinance are often received from manufacturers.

The Schenectady plan is full of corner-cutting schemes, which, I fear, will not endear it to the hearts of those who take air hygiene as a scientific problem for scientists. The inspectors are not technically trained to solve combustion problems. Their findings cannot, therefore, be used to force compliance with the law by strong arm methods. The Schenectady program is planned, of necessity, to be politely persistent rather than belligerently bossy.

The low cost smoke abatement plan is not an aggressive, speedy method of giving a community its place in the sun. It can, however, provide the means of keeping an existing program from complete extinction and may even enable new cities to inaugurate atmosphere sanitation in the face of economic odds. The Schenectady plan makes use of a fire prevention inspection staff. Other cities may make use of some other official or non-official group. The keynote of successful smoke abatement is coöperative effort. It is on the foundation of concerted effort that low-cost smoke abatement can be built.

German Health Center for Mental Disorders

A HEALTH center for mental and nervous disorders, excluding feeblemindedness, is functioning in a suburb of Berlin. The work of the center is concerned with both adults and children. Some children are brought voluntarily by their parents, but the great majority come from the public schools, the Children's Bureau of Berlin, the child health centers, and other welfare agencies. At the child health centers, all children above the age of 3 are examined as regards language, habits of cleanliness, and behavior while at play, and those deviating from normal are referred to the center for mental and nervous disorders, where the necessary treatment is provided. In this way it is hoped to introduce a general system of psychological testing of young children in order to detect early any deviations from normal. — *Gesundheitsfürsorge für das Kindesalter*, Berlin, 7, 6, 1932.

Bacterial Content of Frosted Hamburg Steak*

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THE increasing popularity of foods preserved by the quick freezing process is causing attention to be focused upon the numbers of bacteria which may be expected in such foods. How does the total count compare with the total count of food of the same kind and grade unfrozen? Will the freezing process and subsequent cold storage kill an appreciable number of the bacteria originally present?

In the case of fish products, Birdseye [1] has shown a marked reduction in total numbers during the process of preparing, freezing, and storage. Berry [2] has shown a reduction of 90 to 99 per cent in berries after freezing and storage, for 1 year at 15° F.

This paper is concerned with hamburg steak, since this product is subjected to considerable manipulation, and is known to yield a high count of bacteria.

Several investigators studied the plate count of hamburg steak as an index of its sanitary quality. Marxer [3] suggested that a sanitary limit of 1,000,000 bacteria per gm. be set, but in 1914 Weinzirl and Newton [4] found this standard too low and suggested 10,000,000 as fairer. In 1917 Lefevre [6] made counts on 22 samples of hamburg steak in Washington, D. C., and his results checked closely with those of Weinzirl and Newton, but he concluded that 1,000,000 bacteria per gm. was not an unreasonable limit.

The present investigation includes counts upon 10 samples of fresh, unfrozen hamburg steak as bought in the markets, and 10 samples of Birdseye Frosted Hamburg Steak, bought from retail stores. The frosted hamburg steak was purchased in 1 lb. Peters type cartons in which it was offered for sale. The cartons were not opened until they reached the laboratory, but in each case the contents were still solidly frozen when opened.

The unfrozen hamburg steak was bought in clean, first class meat markets. In the case of 7 of the samples the meat was removed by the market attendant from an already ground batch on display in a refrigerated case. The other 3 samples were ground at the time of purchase. The purchaser of the meat in each instance insisted upon "highest quality."

The purchases were all taken to the laboratory as quickly as possible and sampled within 1½ hours. For each specimen of hamburg steak, 3 check samples were taken from different portions of the mass. Six plates were

* Read before the Food and Nutrition Section of the American Public Health Association, at the Sixty-first Annual Meeting in Washington, D. C., October 22, 1932.

counted for each of the 3 check samples, and the average was taken as the count for that particular sample. The average of the counts of the 3 samples was then taken as the count for the batch of hamburg purchased, making an average of 18 plate counts for each figure given in the tables which follow.

In the literature reviewed no reference to a standard method was found, and little was said of the method followed. It is evident that in work dealing with materials of the class here reported on, the technic of preparing the sample is of utmost importance. The more thoroughly the tissue is disintegrated, and the clumps of bacteria broken up, the nearer the plate count will approach the actual number of living organisms present. This will mean, with the present technic, a somewhat higher count than some of those recorded by earlier observers. The procedure adopted in the present investigation was originally described by Dr. P. K. Bates, director of the bacteriological laboratory of the Frigidaire Corporation, and modified by the authors in conjunction with H. C. Needle of the Massachusetts Institute of Technology. It is as follows:

Ten c.c. of a rather coarse white sand (20–40 mesh), and 90 c.c. of distilled water are placed in a 300 c.c. Ehrlenmeyer flask, which is then plugged and sterilized, and, before using is cooled to 35° F. The plug is removed, the neck flamed, and the flask weighed. Approximately 10 gm. of the sample are placed in the flask, which is then reweighed. All weighings are made to the nearest 0.1 gm., and the calculations are made upon the basis of the actual weight of the sample. The hamburg steak should be thoroughly mixed with a sterile spoon, and the samples added to the flask with sterile forceps, picking pieces from various portions to obtain a representative sample. The flask is then tightly closed with a sterile rubber stopper and placed in a refrigerator at 35° F. for 1 hour. Experimental evidence has shown that bacteria will not increase materially at that temperature during this period, and the water works its way into the interstices of the meat, weakening its structure and allowing better maceration upon shaking. The flask is then placed in the shaking apparatus, which has a stroke of 6 inches (1 foot per revolution) and makes 180 revolutions per minute. The flask is shaken for 5 minutes, after which it is removed and allowed to stand for 5 minutes. During this time the sand and larger particles separate out, but most of the bacteria remain in suspension, and the solution can be pipetted readily.

The solution in the flask is now considered 1:10 dilution: that is, the number of bacteria per c.c. is 0.1 of the number per gm. in the hamburg steak. Dilutions 1:1,000, 1:10,000, 1:100,000, and 1:1,000,000 were made as a routine, and plated upon Difco nutrient agar. All plates were incubated at 25° C. for 72 hours.

The results of the examinations are shown in Tables I and II, and show a definitely smaller number of bacteria in the frosted hamburg steak than in the fresh. No sample of the frosted hamburg steak showed a count as high as the lowest of the fresh, and the average count of the frosted is 89 per cent less than the average of the fresh.

The above facts led to a consideration of why the frosted meat contained relatively so few bacteria. Ten packages of the unfrozen hamburg steak were obtained from the establishment which had packed the frozen samples used in the first experiment. From each of the 10, 3 samples were taken according to the method described, the packages were then frozen in a Birdseye multiple plate froster, according to regular commercial procedure, and 3

TABLE I

TEN SAMPLES OF UNFROZEN HAMBURG STEAK

Market	*Bacteria per Gram*
No. 1	24,300,000 *
2	43,700,000
3	6,000,000
4	6,700,000
5	18,300,000
6	16,200,000
7	8,500,000 *
8	10,100,000 *
9	27,100,000
10	20,100,000
Average of 10 samples	18,100,000

* Freshly ground at time of purchase.

TABLE II

TEN SAMPLES OF FROSTED HAMBURG STEAK

Dealer	*Bacteria per Gram*
No. 1	1,100,000
2	2,600,000
3	2,400,000
4	1,500,000
5	2,400,000
6	3,200,000
7	2,100,000
8	2,300,000
9	1,900,000
10	700,000
Average of 10 samples	2,000,000

samples again taken from each package. A third series of 3 samples was taken after 1 month's storage at 0° F. The results are given in Table III.

The quick freezing process causes a material reduction in the numbers of bacteria and, in general, the greatest reduction comes in those samples having the highest initial count. The per cent reduction varies from 66.6 to 87.9 per cent, the average being 79.5 per cent. A subsequent period of storage of 1 month at a temperature of 0° F. still further reduces the numbers of viable bacteria, the average reduction under these conditions being 24.5 per cent. The over-all average reduction due to freezing plus storage for 1 month is 84.1 per cent.

A sanitary standard considerably below 10,000,000 per gm. seems warranted for this type of product, and bacteria counts of properly frosted and stored hamburg steak may be expected to be consistently lower than those of the best grade of the fresh product for sale in high class meat markets.

TABLE III

BACTERIAL COUNT BEFORE AND AFTER FREEZING, AND AFTER ONE MONTH'S STORAGE AT 0° F.

Sample No.	*Bacteria per gm. Before Freezing*	*Bacteria per gm. After Freezing*	*Per Cent Reduction During Freezing*	*Bacteria per gm. After Storage*	*Per Cent Reduction During Storage*	*Total Per Cent Reduction During Freezing and Storing*
1	11,400,000	2,600,000	77.2	1,300,000	50.0	88.5
2	22,300,000	2,800,000	87.9	1,200,000	57.1	94.5
3	14,400,000	2,100,000	85.4	1,600,000	23.8	88.9
4	9,800,000	2,300,000	76.5	1,100,000	52.1	87.8
5	12,400,000	2,000,000	83.9	1,200,000	40.0	90.3
6	3,600,000	1,200,000	66.6	1,300,000	08.3*	63.9
7	11,400,000	2,100,000	81.7	1,900,000	09.5	83.3
8	9,600,000	1,900,000	80.3	1,500,000	21.1	84.3
9	15,400,000	4,000,000	74.1	2,100,000	44.5	86.3
10	5,900,000	1,100,000	81.4	1,600,000	45.4*	73.1

* Increase

Average bacteria per gram before freezing	11,600,000
Average bacteria per gram after freezing	2,200,000
Average per cent reduction during freezing	79.5
Average bacteria per gram after storage	1,500,000
Average per cent reduction during storage	24.5
Average total per cent reduction during freezing and storage	84.1

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The Doctor and His Business

NO, the doctor in the past has not been good at business and most of those who happen to possess that talent soon leave the profession for fields where they more properly belong.

Why he should refrain from forcible collection of his unpaid bills; why he does not patent some of his prescriptions, inventions and discoveries and make a fortune; why he should continue to counteract the spread of diseases he has painfully and at great educational expense learned how to diagnose and treat; why he should so strenuously oppose year after year the efforts of antivivisectionists and antivaccinationists with their Christian Science allies to cripple research and to annul statutes already on the books, knowing his calls would increase did they have their way; and why at the same time he should continue to work longer hours for less pay during a shorter life of activity than most people is an enigma to a hard-headed business man.

To be sure, business is now recognized as one of the professions in certain educational circles, but whether this will elevate the ethics of business which is fundamentally competitive rather than fraternal, or whether it will undermine the code of medicine remains to be seen. . . .

And since everyone is doing it, how long will the doctors continue as a class to resist? When they no longer do, and adopt the advertising methods of those parasites of the profession, the quack and the patent mediciner, God help the man of modest means and everyone else, whether below him or above him in the social scale, who may some day need a doctor. . . .

The explanation of the doctor's seeming want of business acumen lies partly in the restraining influence of his time-honored precepts of conduct, partly in his preference to hold the respect of his own kind rather than of the financial world, and partly because inherently he's that kind of person else he wouldn't have gone into medicine in the first place. He's already done a great deal not only for the poor, but for the man of modest means as well, and it is offensive to be told by a board of lay people that he's neglecting them.—Harvey Cushing, M.D., Medicine at the Crossroads, *J.A.M.A.*, May 20, 1933, page 1571–72.

A Plan to Obtain More Accurate Records of Infant Hygiene Field Work*

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WHEN a study of the causes of high infant mortality in Delaware was undertaken it was found that the nurses' records were of little value as a source of information. This was due to lack of uniformity, omissions, and masses of meaningless data.

All nurses were interviewed individually regarding the method of recording. In most instances it was their opinion that the records were used as a check-up on the amount of work done rather than the type of field work or the conditions found. For the most part, they had only a vague idea of the number or causes of infant deaths, the number of breast or bottle fed babies, and, with the exception of a few outstanding cases, the conditions in general.

Formerly the plan of operation was as follows. A state law requires attendants at birth to report the birth by post card within 24 hours. From the post cards a list of births in each nurse's district was made up and sent to that particular nurse. This was done before the attendant had issued the birth certificate. From 2 to 6 months later the birth certificate would be sent to the nurse for delivery. The original object in issuing the birth certificate by means of the nurses was to give them a means of entry into the homes, yet by the above mentioned plan the nurse had, in many instances, visited the home so that the delivery of the birth certificate reverted to the plan of taking a day or two each month simply to go from one home to another to leave the certificate.

In 1930 a different plan was adopted in one county and extended to the entire state in 1931.

The program now in vogue is as follows: All original birth and death certificates go directly to the office of the director of the division of child hygiene. As soon as they are received, the birth certificate is issued, a 5″ x 8″ child record card for each birth, and an infant death card for each death under 1 year of age and each stillbirth, are typed. All are sent directly to the particular nurse from whose district the reports were received. The clerk in the county unit files the birth cards in the nurse's file. Printed paper duplicates of the child record cards are supplied on which the clerk types the information from the original cards. These duplicates and the birth certificates are given to the nurse. The certificate is delivered when the nurse makes the home visit, and while in the home the nurse writes all data on the duplicate record. These records are then given to the unit health officer who inspects each one carefully to see that the necessary information is given and makes a note on the record when the case is to be seen again, at which time another duplicate record form is given to the nurse. The clerk types the information on the

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original record card and it is returned to the file. The records of infant deaths and stillbirths are filed in the nurse's file and the birth record which corresponds with the death record card is removed from the birth file and clipped to the death record card. If the birth record corresponding with the infant death or stillbirth has not been received, a request is made for the birth certificate. The record cards used are shown here:

CHILD'S RECORD (Front)

Sex ..... Color ..... Mother's age .....

Family Name ..... Father ..... County ..... Town .....

Child's Name ..... Mother ..... District .....

Birth Date ..... Place ..... Registered .....

Attendant ..... Delivery .....

Injury at birth ..... Eyes (Normal or Diseased) ..... Drops .....

Breast Fed from ..... to .....

Bottle Fed from ..... Formula .....

Weaned at ..... month of age. Condition of Umbilicus .....

Contagious Disease .....

Immunizations .....

Remarks .....

CHILD'S RECORD (Back)

SUPPLEMENTARY RECORD

Date	Age	Weight	Height	Services Rendered	Nurse

At times the nurses find unreported births. When this occurs a duplicate birth record sheet is made out, and from this an original card, and from the original record a request is forwarded to the State Board of Health for a certificate. The State Board of Health then sends a request to the attending physician for the birth certificate. This is an additional reason for having the father's and mother's names as well as the child's name, and address of the family, "registered" and "attendant" included on the record card. Under "Remarks" the nurses have been instructed to include conditions in the home, coöperation, financial conditions, and all things which in their opinion have direct influence upon the health of the child.

The nurses also include such information as suspected or known cases of tuberculosis, so-called children's diseases, prenatal cases or unreported births in the home or in homes closely adjacent.

The age of the mother is included because a study of the records for the past few years has been carried on to determine whether age of mother at child birth is changing. It is obvious that many items have been omitted. An attempt has been made, however, to obtain as much information as possible having direct bearing upon conditions as found, with a minimum of clerical work.

Several things have been accomplished. The nurses, unit health officers, and the director of child hygiene now have a better idea of conditions existing in each nurse's district. More accurate records are being kept. The infant mortality rate is calculated for each district and causes of infant deaths are discussed with each nurse and a definite program is being formulated. Several unreported births have been found. Without additional personnel, information is being obtained pertaining to other phases of public health work. Efforts are being made to establish more prenatal and venereal disease clinics.

For the first 6 months each nurse was required to visit the home of every baby twice before the child was 6 months of age, to give the unit officer an idea of conditions. Recently the program has been revised so that to wealthy families the certificate and literature are sent by mail, and the nurse is not required to visit the home unless requested to do so. The nurse visits the homes of the families of moderate means once, at which time she determines whether it is practical or advisable for her to visit the family again. All white families in poor financial circumstances and all colored families are given as much attention as the unit officers think necessary, but all are seen at least twice before the babies are 6 months old. After the first visit, if the mother becomes a regular attendant at the health center the home is not visited unless there is some particular reason for so doing.

Formerly it was the custom of the nurse to devote Saturday mornings and about an hour at the end of each day to clerical work. Under the present plan the nurse is allowed only a short time each day in the office to receive instruction unless a conference is to be held. The clerk has complete charge of the files and they are all kept in uniform order so that a representative from the State Board can obtain a reasonably accurate idea of conditions in any and all districts in a minimum of time.

The nurses are now more keenly interested in preventing as many infant deaths as possible and in finding unreported births, so that the infant mortality rate may be as low as possible in their districts. They are not devoting as much time to work not pertaining to their own field of activities as formerly.

More effective work of the infant hygiene nurses and better records alone will not solve all of our problems in this field, but at least it seems to be a step in the right direction.

Under the present plan of operation we have a better idea of the conditions prevailing and a better basis upon which to construct the infant hygiene program.

Sweden—Prenatal and Infant Health Work

THE first report on the prenatal and infant health work started by the National Government of Sweden on October 1, 1931, mentions the success of the work and quotes requests from many localities for its continuation. A special committee of experts recommended in 1929 the organization throughout the country of a system of prenatal and infant health work. As a result it was decided to begin the work by way of experiment in four Provinces; the national legislature appropriated the money, and the beginning was made on October 1, 1931. Some time in advance a preparatory campaign was instituted by the Government for the purpose of familiarizing the public with the importance of preventive health work. Notices were printed in the press, literature was distributed, and talks were given by the public health nurses, midwives and others.

The work was of a preventive nature and was concerned with expectant mothers and young mothers and their infants. It was performed by the health officers of the Provinces, who were physicians, with the assistance of the district nurses and district midwives, and was under the supervision of two experts who made inspection tours through the different places. Most of the work was done in rural communities, although a few cities were also included in the territory. Expectant mothers were given thorough physical examinations and instruction in the proper care of their health by the health officers. Home visits were made by the district midwives. The postnatal care was carried out by the health officers assisted by nurses who also visited the mothers and children at their homes. A certain amount of follow-up work was also done.

The reports for each of the four Provinces where the work was done show that 40 per cent of the expectant mothers and 50 per cent of the newborn infants received preventive care; this, although admittedly not a high percentage, is considered a good showing for a new undertaking, particularly in view of the cold weather, long distances, and bad roads. In general, the public showed great interest in the work and were particularly appreciative of the preventive care, although in some cases the value of the work was underestimated. Some immediate results of the work have already been observed; for instance, greater attention on the part of the mothers to the cleanliness of the infants and of their beds and clothing. On the whole, the experiment is considered sufficiently satisfactory to warrant good expectations for the future.

The National Government has extended its appropriation to July 1, 1933.—*Tidskrift för Barnavård och Ungdomsskydd,* Stockholm, 7, 5, 1932.

Nonspecific Flocculation of Diphtheria Antitoxin, Toxin, and Toxoid, and Its Bearing on the Lf Titer

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THE titration method by flocculation of diphtheria antigen and antitoxin, has been suggested as an evaluation of the antigenic and antitoxic properties.

The flocculation test has been termed " rigoureusement specifique " by Ramon,[1] and the idea has gradually developed that animal tests are unnecessary for the determination of antigenicity and antitoxin unit content, and that the much easier flocculation method can be substituted without loss of accuracy.

DEVELOPMENT OF THE FLOCCULATION TEST

Early work by Calmette and Massol [2] showed that toxin and antitoxin would flocculate in a test tube when mixed, and a method was developed for the measurement of the antitoxic value of anti-venom by flocculating it in increasing amounts with a constant volume of cobra venom.

Nicolle, Césari and Debains [3] described the flocculation of diphtheria toxin and of tetanus toxin by their homologous antitoxins, but their method of titration involved concentration of the toxin by sodium sulphate, admixture of the concentrated toxin with gelatin, and a ring test with varying dilutions of antitoxin.

Ramon [4] developed a simple method by which he determined the number of antitoxic units of diphtheria immune sera, and the antigenic value of diphtheria toxins and toxoids. Serum and antigen were mixed in different proportions in test tubes, and the tube which flocculated first was selected as containing a neutral mixture of antigen and serum—Ramon's " flocculation initiale."

Ramon's work was soon confirmed by Schmidt,[5] Scholz,[6] Glenny and Okell,[7] Bayne-Jones,[8] and many other investigators, and the flocculation (Lf) value was defined as the amount of toxin, equivalent to one unit of antitoxin as determined by flocculation. The Lf value of a toxin or a toxoid is frequently referred to as " antigenic value " or " immunizing value."

RELATION OF FLOCCULATION TO PRECIPITIN TEST

Soon after Ramon's publication, several workers, however, raised the question whether the flocculation reaction really was different from the well known precipitin reaction, which generally takes place between an antigen and its homologous antibody.

Bronfenbrenner and Reichert[9] studied botulinus toxin and came to the conclusion that the amount of flocculation and the width of the flocculating zone varied approximately with the esti-

mated amount of bacterial protein in the toxic filtrate, and that the flocculation of toxin with antitoxin was a specific bacterial precipitation phenomenon.

Moloney and Weld [10] found that there was "no obvious relation between the agglutination titer of a serum and its antitoxic content."

Schmidt [11] also observed that the precipitate which forms when antibacterial precipitin is added to diphtheria toxin does not remove the toxin nor interfere with its subsequent flocculation with antitoxin. A new flocculation occurs when the toxin, from which precipitable bacterial residues have been removed, is added in equivalent proportions to the antitoxin. After removal of the precipitate formed by antitoxin in the "indicating tube" showing the "flocculation initiale," no further flocculation occurs when more antitoxin is added. Bayne-Jones [12] has confirmed these experiments and demonstrated the independence of the toxin-antitoxin flocculation with reference to bacterial proteins.

DISCREPANCIES IN THE FLOCCULATION TEST

Glenny,[13] and Glenny and Wallace [14] state that the flocculation reaction sometimes would give widely diverging values when compared with animal tests. For example, the flocculation value of a serum was 160 units, while animal tests showed that the serum contained 260 units.

The authors of the present paper have repeatedly made similar observations on titrations of trial bleedings. For instance, the flocculation value for one horse was 550 units, while the guinea pig tests showed more than 1,100 units.

Another source of discrepancies is the zone phenomenon, where flocculation occurs in two or more zones with the same amount of toxin, but with different amounts of antitoxin. This phenomenon is especially prevalent in the flocculation of mixtures of tetanus toxin and antitoxin,[15] on account of which the tetanus flocculation has not been accepted as a measure of antigenic and antitoxic units; but the zone effect is occasionally met also in the flocculation of diphtheria antigen and antitoxin.[16]

Povitsky [17] relies almost entirely upon the Ramon flocculation test for the titration of toxoid, and she states that since 1924 this test has been used in all phases of toxin, toxoid, and antitoxin production for the determination of antigenic and antitoxic units. She is of the opinion that the discrepancies between guinea pig and Ramon test noticed usually are due to the wrong proportions of toxin and antitoxin, and explains it as follows:

> When a serum gives a reaction at the usual temperature with the standard toxin in 2, 3, or more hours, when it should give it in 1 hour, we know that the amounts of toxin and antitoxin are not proportionate. The test is repeated several times until the reaction is obtained within the proper time. The Ramon test, when the amounts of toxin and antitoxin are proportionate is, in the opinion of the author, one of the most reliable we have. The reactions which occur later on either side of the indicating tube are not specific and may lead to wrong calculations.

In this connection it may be stated that some horses may give antitoxic sera that flocculate in 2 hours,[18] 3 hours, and 6½ hours,[19] and that flocculation time is greatly influenced by the temperature of the water bath in which the flocculating tubes are immersed.

Linderström-Lang and Schmidt [20] prepared a purified antitoxin by alcohol precipitation and ether extraction which did not flocculate, but had retained its avidity and neutralizing power for toxin.

Jensen[21] calls attention to investiga-

tions carried on at the State Serum Institute at Copenhagen, according to which the correctness of Ramon's contention, that the flocculation value is an expression of the immunizing power, must be considered questionable.

Bächer and Kraus [22] caution against the identification of flocculation with toxin-antitoxin binding, and have prepared antigenic diphtheria toxins which did not flocculate.

In the concentration and purification of diphtheria toxin and toxoid, this lack of power to flocculate is often encountered, although the antigenicity is retained or only somewhat diminished.[16, 23] This is, for instance, the case in the purification by alcohol, by acids, and by combined acid and alcohol precipitation.[24]

On the other hand, Gross,[25] and later Ecker and Weed,[26] purified diphtheria toxin by adsorption to magnesium hydroxide and colloidal magnesium, but although their purified product contained about 32 "antigenic" (flocculation) units per c.c., which value was determined by Povitsky, the purified toxin was completely lacking in antigenicity, being incapable of immunizing rabbits and guinea pigs.

Not only absence of ability to flocculate, with retained immunizing power, and high flocculation values with lacking antigenicity are found, but nonspecifically increased flocculation values are also encountered.

When toxins and toxoids, which have been purified by adsorption to aluminum hydroxide,[24] are eluted by a solution of disodium phosphate and the elution is made up to the original volume, the flocculation value will in some instances be increased to much more than 100 per cent, while the flocculation time is considerably decreased. Figures on record show that a toxoid which originally flocculated 12.4 units per c.c. in 2 hours and 6 minutes increased its flocculation value to 17 units in 25 minutes, although it was evident from animal experiments that the recovery of the toxoid from the precipitate by elution was far from complete.

It has always been the object to produce as strong a toxin as possible for the production of antitoxin, and the increasing use of toxoid of high antigenic value for immunization against diphtheria has stressed the demand for strong toxin. A toxin containing 10 to 15 flocculation units was until lately considered a strong toxin, but it is now possible to make toxins of 60 flocculation units [27] or even more,[28] and concentrated toxins and toxoids of several hundred units.

The chemical composition of the floccules which are formed when diphtheria toxin and antitoxin are mixed in suitable proportions has been investigated by Flössner and Kutscher [29] who found that the floccules consist of 86.36 per cent magnesium ammonium phosphate, 10 per cent alcohol-insoluble protein, 1.1 per cent alcohol-soluble protein, and 2.52 per cent lipoid.

The organic constituents of the floccules have been attributed to bacillary lipoprotein and serum precipitins, and Moloney and Weld [10] suggested that the toxin-antitoxin complex merely was carried down by adsorption. Hartley[31] proposed that the toxin-antitoxin compound was adsorbed upon lipoids which became flocculated from the serum during the reaction, and Friedberger and Ikeda [32] were of the opinion that the toxin-antitoxin complex was largely a lipoidal aggregate.

It may be mentioned in this connection that Lohmann [30] has demonstrated the presence of pyrophosphates in striated muscle, in yeasts, and in bacteria. Pyrophosphates will react with magnesium compounds and form precipitates which are soluble in an excess of pyrophosphate solution, as well as in

TABLE I

FLOCCULATION DETERMINATIONS

2 c.c. of	Amount of Antitoxin etc. in 0.001 c.c.						Time	Antitoxin etc.	Indicated Units
Saline with 0.1% Sod. Pyroph.	*2,000*	1,500	1,000	750	500	250	2 m.	1,389	>400
Saline with 0.025% Sod. Pyroph.	2,000	*1,500*	1,000	750	500	250	3 m.	1,389	300
Saline with 0.0175% Sod. Pyroph.	1,200	1,100	1,000	*900*	800	700	12 m.	1,389	180
Saline with 0.01% Sod. Pyroph.	2,000	1,500	1,000	*750*	500	250	25 m.	1,389	150
Saline with 0.005% Sod. Pyroph.	700	600	500	*400*	300	200	18 h.	1,389	80
Saline with 0.1% Sod. Pyroph.	*2,000*	1,500	1,000	750	500	250	12 m.	Normal Serum	>400
2% Peptone with 0.05% Sod. Pyroph.	1,250	*1,000*	750	500	250	100	10 m.	1,389	200
2% Peptone with 0.025% Sod. Pyroph.	1,250	1,000	750	*500*	250	100	23 m.	1,389	100
4% Peptone with 0.05% Sod. Pyroph.	1,250	*1,000*	750	500	250	100	15 m.	1,389	200
4% Peptone with 0.025% Sod. Pyroph.	1,250	1,000	750	*500*	250	100	33 m.	1,389	100
6% Peptone with 0.05% Sod. Pyroph.	1,250	*1,000*	*750*	500	250	100	12 m.	1,389	175
6% Peptone with 0.025% Sod. Pyroph.	1,250	1,000	750	*500*	*250*	100	17 m.	1,389	75
2% Peptone with 0.05% Sod. Pyroph.	*1,250*	1,000	750	500	250	100	11 m.	Normal Serum	>250
B. Coli protein(a) solution	50	*40*	*30*	20	10	5	18 h.	1,389	7
B. Coli protein with 0.05% Sod. Pyroph.	2,000	*1,500*	1,000	750	500	250	6 m.	1,389	300
Staph. Aur. protein solution	50	40	30	20	10	5	No floc.	1,389	—
Staph. Aur. protein solution with 0.05% Sod. Pyroph.	1,500	1,250	1,000	750	*500*	250	1 h. 35 m.	1,395	100
B. Diph. protein Solution(b)	275	250	*225*	200	175	150	8 m.	14,505	45
B. Diph. protein Solution with 0.05% Sod. Pyroph.	2,000	*1,500*	*1,000*	500	250	100	6 m.	1,395	250
Toxoid 14,957 (Untreated)	70	68	66	*64*	62	60	2 h. .06 m.	14,505	12.8
Toxoid 14,957 with 0.01% Sod. Pyroph.	1,600	1,400	*1,200*	1,000	800	600	12 m.	1,395	240
Toxoid 14,957 with 0.025% Sod. Pyroph. and an equal volume of 2% peptone solution	2,000	1,750	1,500	1,000	*750*	500	6 m.	1,395	150
Toxoid 14,957 with an equal volume of B. diph. protein sol.	175	*150*	125	100	75	50	3 h. 44 m.	14,505	30
Toxoid 14,957 with 0.025% Sod. Pyroph. and an equal volume of Staph. Aur. protein solution	175	150	125	*100*	75	50	2 h. .05 m.	14,505	20
Toxoid 14,957 with 0.025% Sod. Pyroph. and an equal volume of B. Coli protein solution	175	150	*125*	100	75	50	8 m.	14,505	25

The figures in italics denote the indicating tube.
(a) Flaky flocculation.
(b) Copious flocculation.

an excess of the solution of the magnesium compound. By using pyrophosphate and magnesium in colloidal suspensions, or as compounds where they are chemical components of protein, and employing them according to the Ramon flocculation method, flocculations take place especially in the presence of ammonia salts which are indistinguishable from flocculations of

toxin and antitoxin. There is the same "flocculation initiale" as demonstrated by Ramon, with an "indicating tube," and a supernatant liquid which after removal of the precipitate is free for flocculation producing compounds.

EXPERIMENTAL

Non-specific Flocculation—The general application of the flocculation test in the production of toxin and antitoxin, makes it necessary to know as much as possible about factors which may cause non-specific reactions and consequently erroneous calculations, so that these irregularities may be detected or guarded against.

Observations at this laboratory show: (1) that the flocculation value of a 2½ year old toxoid does not always correspond to the value established by animal tests, but may give a low flocculation value and yet be of satisfactory antigenic activity; (2) that the flocculation of a fresh toxin also occasionally may show irregularities with high flocculation value and lower toxicity than expected according to the flocculation test; (3) that precipitation of extracts of diphtheria bacilli readily takes place with homologous serum, often simulating a true flocculation; and (4) that toxin broth, which accidentally had become contaminated during the production of diphtheria toxin showed higher flocculation values than the uncontaminated flasks.

In view of these facts, and as elutions of toxoid precipitates by disodium phosphate gave too high flocculation values, as floccules largely consist of magnesium ammonium phosphate, as pyrophosphates are present in meat and bacteria, and as pyrophosphates will flocculate with magnesium compounds, a number of flocculations were carried out to determine the influence of the pyrophosphates on the flocculation values. Diphtheria toxins, toxoids, and antitoxins, and different proteins have been mixed with sodium pyrophosphate, with magnesium sulphate and with colloidal magnesium, and flocculated according to Ramon's method.

Technic—The volume of toxin in each tube was 2 c.c. The test tubes were 10 cm. long and 0.73 cm. in diameter. The pipetting was done with 0.1 c.c. pipettes, which are graduated in 0.001 c.c., and the pipettes were wiped off with moist cotton after each immersion into the antitoxin. The water bath was kept at 50° C., and the amount of water in the bath adjusted to cover half of the column of fluid in the tubes.

Some typical flocculations are recorded in Table I and the following reagents were used:

Saline was a 0.85 per cent solution of sodium chloride.

The peptone is "Proteose Peptone" from Digestive Ferments Co., Detroit, and was dissolved in saline.

The bacterial protein solutions were neutral, acid and alkaline saline extracts.

The toxoid 14,957 was made from infusion free medium.[33]

All antitoxins used contained 400 units.

DISCUSSION

It is apparent that pyrophosphates may simulate a true flocculation, and that the addition of pyrophosphates to diphtheria toxin and toxoid can modify the flocculation values.

Since analysis of the floccules in the ordinary flocculation of antitoxin by toxin shows that the floccules mainly consist of magnesium ammonium phosphate, it does not seem improbable that the true flocculation of mixtures of toxin or toxoid and antitoxin is in some way connected with phosphate-magnesium precipitation in the presence of ammonia. Phosphates are present in all media used for the production of toxin, magnesium is a constituent of antitoxin, and ammonia is a metabolic product of the diphtheria bacilli.

It seems therefore as if the flocculation reaction might consist of three different but interlocking reactions: first, a phosphate-ammonium-magnesium reaction; secondly, a bacillary lipoprotein-nucleoprotein-precipitin reaction; and, thirdly, a neutralization of toxin or toxoid by antitoxin. Flocculation, therefore, may be a simple neutralization of toxin or toxoid and antitoxin, or it may be a combination of neutralization and a non-specific reaction, or a non-specific reaction alone.

Since the avidity of a toxin or a toxoid may be changed and considerably lowered by purification, which also removes most of the inorganic constituents, or may be increased as shown by decreased flocculation time, for example, in the case of phosphate elution of toxoid precipitated by aluminum hydroxide, the avidity phenomenon may be more complex than is usually considered. It may, to a certain degree, depend also upon inorganic compounds, which possibly are present as integral parts of the toxin and the antitoxin.

SUMMARY

1. The Ramon flocculation test of diphtheria toxin or toxoid and antitoxin has been claimed to be rigorously specific. Certain non-specific flocculations are, however, encountered, as for example by bacillary proteins, by phosphates and pyrophosphates.

2. Phosphates and pyrophosphates may under certain circumstances enhance the flocculation reaction of diphtheria toxin and antitoxin. This enhancement is expressed by increased flocculation value and decreased flocculation time.

3. The flocculation reaction consists possibly of interlocking reactions of inorganic constituents of the toxin and serum, of bacillary lipoproteins or nucleoproteins and serum precipitins, and of toxin and antitoxin.

Flocculation may be a simple neutralization of toxin or toxoid and antitoxin, or it may be a combination of neutralization and a non-specific reaction, or a non-specific reaction alone.

4. The flocculation reaction is not always specific and, therefore, is not always a true measure of the antigenic value.

5. The flocculation time is not always a true measure of avidity, as determined by flocculation.

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Prevention of Lead Poisoning in Industry*

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THE discussion of this subject, which is probably one of the oldest, if not the oldest, of known industrial hazards, hardly calls for an introduction dealing with its history. No one will dispute the fact that prevention is the only remedy that can be considered as practical.

I propose to present the methods of prevention which have been in actual operation in our company since 1926, as devised by our own Medical Department with the assistance of Dr. Robert A. Kehoe, of Cincinnati, Ohio, in the manufacture of tetra ethyl lead. I have chosen this particular operation because it represents the manufacture and handling of one of the most dangerous lead compounds in industry, being highly toxic by all 3 avenues of entrance, viz., the gastrointestinal tract, the respiratory tract, and the skin. This is the only known lead compound to enter the circulation by the latter route in sufficient quantities to cause poisoning. Since the adoption of preventive measures as formulated in 1926 this operation has been conducted up to the present time without a single case of lead poisoning, and in only a very few instances sufficient absorption to warrant the removal of a man from work. I do not mention these facts in an attempt to glorify our records, but simply to call to your attention that, no matter how toxic the substance, it can be produced and handled safely under the proper precautionary measures.

Preventive measures are divided into two major classes—those applicable to the workmen, and those of operation. All methods of both classes must be carefully planned, rigidly enforced and maintained with the utmost care.

The methods and rules applicable to the workmen are the most detailed and the most difficult to maintain. They begin with a physical examination before the workman is allowed to enter the plant. The examination must be made with great care, and sufficient time allowed to cover intimate and essential details. I do not propose to enter into a detailed description as to how a physical examination should be made; but I wish to point out a few details that require careful analysis.

The first essential is a complete history of the applicant's previous industrial life, covering his entire working period from the beginning and up to the time of his examination. This history must be very carefully taken and any previous exposure to lead is a definite contraindication to acceptance unless the examiner can assure himself that the exposure was insufficient to have caused appreciable absorption or the industry in which he was employed gave sufficient protection to prevent absorption. Both of these questions are difficult to answer satisfactorily, and I simply mention them as possible qualifications to acceptance. It is unsafe, and decidedly dangerous to the appli-

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cant, and a potential hazard to the employer, to accept an applicant who is already leaded to any degree.

There are certain characteristics which if recognized should be sufficient to exclude the applicant. For example, the lead worker must be amenable to the teachings of cleanliness and sanitation, and the individual whose appearance indicates chronic slovenliness is always a difficult problem and may, in spite of your best efforts, succeed in getting himself into serious difficulties. The irresponsible and, to use the common expression, the "wise guy," will invariably fail to follow instructions and often take keen delight in disobeying them. It is often impossible to impart understanding to one who has insufficient powers of absorption and retention. I refer to those whom we classify as decidedly below normal intelligence. These facts are decidedly pertinent to successful continuance of the operation, because the rules and regulations are numerous and are the very foundation of successful prevention of lead absorption, and each employee must carry out his own particular rôle with exact precision at all times.

Females, and all applicants under 21, are recognized as decidedly prone to lead poisoning, and should be excluded. Also, I feel that applicants over 45 should be eliminated.

After ascertaining these facts, and before making the actual physical examination, the applicant should have carefully explained to him (1) the danger of the operation for which he is being considered; (2) that he will have to work under definite rules which are for the protection of his health, and failure to obey them will mean the possibility of his own illness or dismissal; (3) that the Medical Department is operating for his protection and he is free at any time to present to it complaints of any nature relative to his own personal health, and always on the company's time. This last point is extremely important, as I have found it very difficult and almost impossible to get workmen to sacrifice even a few minutes of their own time.

Immediately following this explanation of danger, the applicant should be asked whether or not he is desirous of working under such conditions, and he is dismissed from further consideration if his answer is negative or if he expresses fear. Employees who are afraid of lead work are very liable to be constantly presenting subjective symptoms with no objective findings, and soon become a problem to the examiner.

The personal history should bring out certain facts, such as the presence of chronic gastrointestinal disorders, gastric or duodenal ulcer, bowel habits and appetite, with special reference to breakfast. The average workman eats a good breakfast, and one of the early subjective symptoms of lead poisoning is a lack of early morning appetite. Sleep and its nature should be recorded, as insomnia and dreams are early symptoms of lead poisoning. The particular point that I am trying to make is this—if you record a complete history at the time of employment, it is easy to check any alleged changes later, but without the initial record you will find it extremely difficult to arrive accurately at definite conclusions.

The actual physical examination is conducted in the usual complete manner, and bearing in mind the general toxic effects of lead there are many conditions that necessitate rejection of the applicant, such as circulatory disturbances of any nature, nephroses, acute or chronic infections, syphilis, diabetes mellitus, neurological disturbances of any kind, anemias, and carious teeth until repaired. It is our policy to have the teeth of our men, after acceptance, examined, cleaned and repaired by our own dentist, who

operates at our plant on a full-time basis.

A complete blood count must be made at this time with a careful search for stipple cells, for future comparison. We have often found applicants showing numerous stipples who have denied previous lead exposure, usually intentionally. The presence of stipple cells is sufficient cause for rejection.

The applicant who has passed this physical examination must be in good physical condition, and from this point on it is the moral and legal obligation of the employer to exert every possible human effort to maintain and protect his health by (1) careful and frequent medical examinations, (2) rigid rules of conduct during working hours, and (3) installation and maintenance of proper mechanical protective and operative devices.

MEDICAL EXAMINATIONS

The frequency of medical examinations is, in all industrial hazards, determined by the toxicity of the material being handled, the possibility and rate of absorption, and the minimum time in which physical signs and symptoms may appear. We made our lead examinations weekly for several years, and by virtue of our experience have now changed the schedule to every 3 weeks.

Each examination consists of a careful search for subjective and objective signs of lead absorption, including a complete blood count, with a careful search for stipple cells. In our stipple cell counts we examine 50 oil immersion fields, and consider the presence of these cells as indicative of lead absorption, but regardless of the number, in no way indicative of the degree of absorption. The degree or severity of lead absorption must be decided by the presence of subjective or objective symptoms and signs, either one or both, together with blood changes as determined by a reduction in the hemoglobin, a reduction in the number of red cells and the presence of any number of stipple cells.

The periodic lead examinations must be conducted on a regular schedule and in the event of any doubt or suspicion as to the presence of even very slight signs or symptoms, the patient should be immediately subjected to daily observations until his condition is definitely determined. It is most difficult to set up any definite standard for determining when a man has absorbed sufficient lead to warrant his removal from the work, in order to prevent the appearance of symptoms. In general, I believe it safe to say that when a worker begins to show even a slight digestive change, has lost a little weight, lacks a noticeable degree of his original stamina and shows stipple cells with some reduction in the number of the red cells and hemoglobin, he should be removed. To some this might seem like the actual presence of lead poisoning rather than lead absorption, but regardless of the degree, this type of worker can be changed to a lead-free occupation without any loss of time and in a relatively short period be entirely symptom free. In other words, he has not been poisoned to the point of invalidism, has not suffered any lasting effects and can be eventually returned to his original work. The occurrence of absorption in sufficient degree to warrant removal indicates faulty operative methods or failure to follow working rules, and calls for immediate investigation to determine the real source of the trouble and the application of proper remedies.

I should say something about the estimation of lead in the urine and feces. We do not make these estimations as a routine because we are convinced that our examining technic is sufficiently thorough to detect any appreciable degree of lead absorption, and

there are too many details and too much time is involved in making these tests properly to warrant the expense. The amount of lead in the feces is not a true indication of the amount absorbed as it is impossible to determine how much has passed directly through the intestinal tract and how much has been excreted. Lead in the urine must necessarily represent lead that has been absorbed, but before a worker is excreting sufficient quantities to denote lead poisoning he should have been eliminated by the physical examination.

RULES OF CONDUCT

Before stating any rules that govern the daily conduct of lead workmen, I wish to call your attention to the fact that before these can be properly enforced, each worker must be carefully instructed in each individual rule, and must be supplied with certain necessities that will enable him to follow out every detail. He cannot take a bath unless provided with the proper means, neither can he put away his street clothing if there is no place to put it, and unless provided with a lunch room he is apt to eat in any convenient place. I have seen factories where the rules of conduct were quite adequate, but the management had made no provision for the equipment necessary, thus making them a mere gesture toward precaution.

The first necessity is a proper change house, and I strongly recommend that the house have two locker rooms, one for the street clothing and the other for the working clothes, and adjoining or between them washing and bathing facilities. Shower baths should be attractive and sanitary in construction, and above all should be kept clean and orderly. A lunch room in the change house is the ideal location as it gives each worker the opportunity of storing his lunch in his own locker and provides the necessary washing facilities which he must use before eating.

Rules which each lead worker in our employment must follow are:

1. Before going to work each man is given two clothing lockers located in different rooms, one to be used for street and the other for working clothing.

2. Each day before reporting for work he must remove all street clothing and put on a complete working outfit. We supply these outfits, 2 to each man, and they are washed in our laundry twice a week, at company expense.

3. At the end of each day every man must take a shower bath.

4. No food of any kind may be taken into or consumed in the lead buildings. All lunches must be eaten in rooms provided for this purpose and each man must wash his face and hands before eating.

5. Each worker must carefully obey all the rules of operation and immediately report the faulty operation of any equipment.

6. Every worker must report to the Medical Department when sent for and at any time when he does not feel well.

7. Anyone who is unable to report for duty for any reason whatsoever, unless previous arrangements have been made, must communicate with his foreman on the day of his absence and give his reason for failure to report. This rule keeps us in constant contact with every worker and when he reports sick his case is immediately investigated by our Medical Department.

The adoption of working rules and the institution of employment and periodic examinations may be safely considered as essential in all lead operations, but must always be supplemented by factory control methods of operation. I have frequently heard it said that sanitary rules are sufficient to control any lead operation, and I very definitely deny this assertion. The most rigid examinations and the most elaborate sanitary working rules will not prevent lead absorption and lead poisoning in a dirty operation, and by this I mean one where lead dust or fumes are constantly in the air.

A great deal has been written relative to the exposure necessary to produce lead symptoms and it is generally accepted that the absorption of from

1 to 2 milligrams per day will cause lead poisoning in from 9 months to 1 year, while the absorption of 10 milligrams per day will cause acute poisoning in a few weeks. However, when we take into consideration certain unknown factors such as personal susceptibility, rate of absorption and tolerance together with the amount of air contamination, as carefully measured by chemical analysis, it is impossible to state definite figures in milligrams per cubic meter which may be considered safe for any group of workmen. This being the case, the only safe method of operation is the one in which the lead content of the air is reduced to the absolute minimum. I question the possibility of absolute freedom of lead dust and fume in certain types of operations, at least with the present available equipment.

There has been much discussion as to the comparative toxicity of various lead compounds and here we are dealing, not with the toxicity of the actual material, but with the amount that is being absorbed, and the safest method is to consider them all toxic and institute measures that will give minimum absorption.

The two major industrial problems are elimination of dust and fumes. Dust problems have two main points of origin—the method of handling materials, and process machinery. The handling of dry, dusty lead compounds can be controlled to a certain degree by instituting a careful method, but these measures tend to slow up the operation and are always dependent upon careful supervision at all times, as the human element of carelessness is certain to become troublesome. The use of respirators is fairly satisfactory provided the respirator is efficient, comfortable to wear, and is worn at all times. Anyone who has had experience with respirators must admit that under the most favorable circumstances they leave much to be desired. This narrows the field down to the most efficient and satisfactory method of dust control at the point of origin, which is exhaust ventilation.

Exhaust ventilation, properly designed and properly maintained, will reduce dust hazards to the absolute minimum. The type of hoods, the rate of exhaust, and all other problems in connection with the operation can be readily solved by ventilating engineers. The consideration of these details is an engineering problem, not a medical one. Our own experience has proved that although the initial installation is somewhat expensive, the final results amply justify the cost. Exhaust ventilation not only controls the dust problem but also the fumes. In our lead ethyl operations we have surrounded practically every piece of equipment and, in addition, force fresh, clean air into all workrooms in sufficient quantity to make two complete changes each minute.

I realize that there are a great many companies handling various lead compounds at present whose operations are hazardous to the employees and who because of present business conditions cannot spend the necessary money to install either new equipment or exhaust ventilation. Such operations should be cleaned up in so far as possible by tightening up all equipment, instituting careful methods of handling materials, careful rules of sanitation for the workmen, and competent medical supervision.

Cleaning and keeping clean all factory workrooms is extremely important. Dry sweeping should never be allowed. Floors and equipment should be washed down whenever possible; and under circumstances which do not permit of the use of water, vacuum cleaning is the method of choice. A few dry sweepings can soon undo all the good accomplished by months of careful observation

and sanitary control. Rafters, beams, windowsills, and all dust collecting parts must be kept free from dust to prevent air contamination by draughts and jarring caused by the vibrations of the equipment.

Chemical analyses to determine the lead content of the air should be made very frequently at all parts of the workrooms; must be conducted by a trained individual; and a record of each test supplied to the Medical Department, as they indicate those operations or sections of operations where trouble is most likely to occur. They also make it possible to pick out the workmen who are subjected to these conditions and watch them more carefully for lead absorption. Such tests act as a check upon the efficiency or lack of efficiency of machinery and exhaust ventilating devices, and indicate the necessity for immediate improvement. I cannot lay too much stress upon the real value and the urgent necessity of air analyses in any lead operation, and I am convinced that the expense incurred is many times compensated for by the actual benefits which result by following up and stopping the leaks that are detected.

In conclusion, I would say: Pick your workmen carefully by complete examinations; instruct them thoroughly in the rules that must be followed all during their working hours; and eliminate dust and fumes at the source. If you do all these things properly, lead absorption will be reduced to a minimum and you should eliminate all cases of lead poisoning.

Antituberculosis Work Among Children in Italy

IN a recent circular to the local antituberculosis committees, which in compliance with the law on compulsory insurance against tuberculosis have been organized throughout Italy, the Minister of the Interior urges the application of preventive measures, particularly to children who have tuberculous parents or who live with tuberculous persons.

Preventive action must begin as early as the prenatal period. It is necessary to search for expectant mothers affected with tuberculosis and to provide for them the necessary treatment, whether in a hospital or, if advisable, in their homes. The infant living with a tuberculous mother or in the same home with another tuberculous patient must be supervised either by the family physician or by a physician from the public tuberculosis clinic. Visiting nurses must teach these mothers proper care of their infants. In a case in which it is not advisable to leave the infant in his own home, he should be placed in an appropriate public institution; the local branch of the National Children's Bureau should then be asked to coöperate with the local official antituberculosis committee.

The Minister also calls the attention of the authorities to the importance of providing physical examinations for all school children and treatment for all active cases of tuberculosis among them and of establishing open-air schools for undernourished children and those suspected of tuberculosis.—*Le Assicurazioni Sociali*, Rome, 8, 5, 1932.

Agglutination in the Diagnosis of Enteric Disease*

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POLICIES adopted in 1913, when the New York State Department of Health was reorganized and Dr. Hermann M. Biggs was appointed Commissioner of Health, have resulted in the development of a highly efficient laboratory service throughout the state. A unique opportunity has thus been provided for the evaluation and establishment of standards, through the coöperation of directors of laboratories approved by the State Commissioner of Health with the staff of the central laboratory in Albany.

One of the most difficult procedures to standardize has been the agglutination test for evidence of typhoid fever. Microscopic tests with living organisms made in 2 laboratories where the same technic is employed and the same strain of *B. typhosus* is used may furnish different results with portions of the same blood specimen, even though the cultures are maintained under the most carefully controlled conditions. Moreover, the value of this type of test as an aid in diagnosis is limited, since similar reactions may be obtained with the blood of persons who have typhoid fever, who have received typhoid vaccine, or who have a febrile disease other than typhoid fever.

The substitution of a carefully

TABLE I

AGGLUTINATION REACTIONS WITH TYPHOID BACILLI OBTAINED IN 230 SPECIMENS OF SERA FROM 209 PATIENTS WITH TYPHOID FEVER

Highest dilution in which complete or nearly complete agglutination occurred	Microscopic test with living culture	Macroscopic test with suspensions treated with	
		Alcohol	Formalin
1:1,200 or higher	6	10	2
1:640	6	19	14
1:320	32	90	60
1:160	56	51	42
1:80	52	35	52
1:40	41	12	30
1:20	25	4	10
No agglutination	12	9	20

* Read before the Laboratory Section of the American Public Health Association, at the Sixty-first Annual Meeting in Washington, D. C., October 24, 1932.

standardized suspension of killed bacteria would lead to greater uniformity and could be recommended if reliable results could be obtained with it. Cultures killed with formalin have been extensively studied and their use has been advocated by a number of investigators. The findings obtained in our laboratory indicated that such suspensions were not satisfactory for the microscopic test.[1] Also, in macroscopic tests, occasionally sera from patients with typhoid fever failed to agglutinate suspensions killed with formalin when reactions were secured in tests with a living culture.

The importance of 2 types of agglutination which can be demonstrated with many species of bacteria was not fully appreciated for a number of years after Theobald Smith and his collaborators[2] had demonstrated, in 1903, that a nonmotile strain of the hog-cholera bacillus agglutinated in the form of a "granular precipitate," while motile strains of the same species agglutinated as a "fluffy precipitate." In 1917, Weil and Felix[3] investigated these properties of *B. proteus* and later they,[4, 5] as well as a number of other workers, made similar studies of species belonging to the enteric disease group. It was learned that data of greater diagnostic value could be secured by a method differentiating the granular from the floccular type of agglutination than by the microscopic test with living culture.

In view of these reports, during the last 3 years the microscopic test with living culture has been supplemented in our laboratory by a macroscopic test with an alcohol treated suspension, which agglutinates in a granular form, as well as one with bacteria killed with formalin, which agglutinates in a floccular manner.[6] Last year, the New York State Association of Public Health Laboratories, an organization which has been most influential in the maintenance of high standards of laboratory service in the state, undertook a joint investigation of this problem. Sera from cases of enteric disease, from patients with various other types of febrile disease, and from typhoid carriers are included

TABLE II

AGGLUTINATION REACTIONS WITH TYPHOID BACILLI OBTAINED IN 7 SPECIMENS OF SERA FROM 6 PATIENTS WITH PARATYPHOID FEVER

Highest dilution in which complete or nearly complete agglutination occurred	Microscopic test with living culture	Macroscopic test with suspensions treated with	
		Alcohol	Formalin
1:160	1	2	0
1:80	3	2	0
1:40	1	2	5
1:20	0	0	0
No agglutination	2	1	2

TABLE III

AGGLUTINATION REACTIONS WITH TYPHOID BACILLI OBTAINED IN 9 SPECIMENS OF SERA FROM 6 TYPHOID CARRIERS

Highest dilution in which complete or nearly complete agglutination occurred	Microscopic test with living culture	Macroscopic test with suspensions treated with	
		Alcohol	Formalin
1:160	0	0	3
1:80	2	5	1
1:40	6	0	2
1:20	0	3	1
No agglutination	1	1	2

in the study. Series of specimens from each patient are tested if they can be secured. The technic, in so far as possible, is the same in all of the coöperating laboratories. The central laboratory in Albany is furnishing the suspensions of *B. typhosus* treated with alcohol and with formalin so that identical antigens will be used. Our experience has indicated that both types of antigen remain satisfactory for at least 6 months.

The results obtained with specimens received in the Division of Laboratories and Research at Albany from January 1, 1931, to September 1, 1932, have been tabulated (see Tables I–VI). On the whole, they correspond with those reported by Felix and his coworkers. The findings indicate that agglutination in a 1:80 or higher dilution with a formalin treated antigen suggests one of 3 alternatives: that the patient has typhoid fever, has had such an infection in the past, or has received typhoid vaccine, while a similar reaction with an alcohol treated suspension usually indicates that the patient has typhoid fever or an infection incited by a species of bacteria antigenically related to *B. typhosus*. Occasionally, as has been noted by Gardner and others,[7] granular as well as floccular agglutination is obtained with sera from some persons who have received typhoid vaccine. Our findings suggest that at times the granular form of reaction may be the stronger of the two. However, a much smaller percentage of unexplained reactions is obtained with this procedure than with the microscopic test with living culture. Also, both granular and floccular types of agglutination have very rarely been observed in high dilutions of sera other than those from typhoid fever patients.

If the results of the joint investigation in which the Laboratory Association is participating confirm our findings, a means will be available for standardizing the agglutination test for evidence of typhoid fever, by the use

TABLE IV

AGGLUTINATION REACTIONS WITH TYPHOID BACILLI OBTAINED IN 36 SPECIMENS OF SERA FROM 34 INDIVIDUALS WHO HAD PREVIOUSLY HAD ENTERIC DISEASE (NOT CARRIERS)

Highest dilution in which complete or nearly complete agglutination occurred	Microscopic test with living culture	Macroscopic test with suspensions treated with	
		Alcohol	Formalin
1:160	0	0	0
1:80	1	2	2
1:40	1	2	0
1:20	4	4	5
No agglutination	30	28	29

TABLE V

AGGLUTINATION REACTIONS WITH TYPHOID BACILLI OBTAINED IN 73 SPECIMENS OF SERA FROM 60 INDIVIDUALS WHO HAD RECEIVED TYPHOID VACCINE

Highest dilution in which complete or nearly complete agglutination occurred	Microscopic test with living culture	Macroscopic test with suspensions treated with	
		Alcohol	Formalin
1:320	0	0	1
1:160	0	6	6
1:80	7	5	11
1:40	12	8	9
1:20	12	15	9
No agglutination	42	39	37

TABLE VI

AGGLUTINATION REACTIONS WITH TYPHOID BACILLI OBTAINED IN 2,532 SERA FROM NORMAL INDIVIDUALS, FROM PATIENTS WITH INFECTIONS UNRELATED TO TYPHOID FEVER, AND FROM THOSE CONCERNING WHOM INADEQUATE INFORMATION HAS BEEN RECEIVED

Highest dilution in which complete or nearly complete agglutination occurred	Microscopic test with living culture	Macroscopic test with suspensions treated with	
		Alcohol	Formalin
1:320	1	1	1
1:160	2	1	4
1:80	16	19	6
1:40	68	114	61
1:20	206	231	153
No agglutination	2,239	2,166	2,307

of a technic which is free from the danger associated with the handling of living culture; is extremely simple to perform; is readily controlled; and which provides data of greater diagnostic significance than the usual form of microscopic test with living culture.

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Italian Traveling Maternal and Child Health Centers

TRAVELING maternal and child health centers are now being organized in those places of Italy where no permanent centers are in existence. According to a recent circular of the Chief of the National Bureau of Maternal and Child Welfare of Italy these centers are to have as their main function the teaching to the mother of the proper care of herself and her child; treatment of illness will not be provided. The circular emphasizes the importance of inducing the mothers to attend the centers. The centers are under the general supervision of the National Bureau of Maternal and Child Welfare and must coöperate with the local branches of the bureau. Accurate reports must be presented daily, weekly, and monthly to the provincial branch of the bureau. The centers must also report to the local branches of the bureau all cases of mothers who are in need of aid.—

Bollettino degli Atti Ufficiali dell'Opera Nazionale per la Protezione della Maternità e dell'Infanzia, Rome, Jan.-Feb., 1933.

Relationship Between Health Officer and Nurse*

Points of View of a Health Officer

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THE aims of the public health nurse must be identical with those of the health officer if effective work is to be done. Harvey Cushing has said, "There is only one thing that can effectively bind people, and that is a common devotion."

Very simply stated, the common devotion or basic aim of all health workers is the prevention of disease. To accomplish this object is the task of the health officer. He must assemble the necessary machinery consisting of workers, materials, knowledge, skills, and laws. To make the machinery work is administration.

In the administration of a health department the health officer's first responsibility is to define policies and formulate programs. In this he is greatly helped by his bureau chiefs on whom he relies for technical expert advice. Because they serve both in the capacity of advisers and of executives, on whom rests the responsibility of getting the job done, these first lieutenants of the health officer assume great importance in the administration of a health department. Their ideals as professional public health workers must be of the highest, their loyalty unquestioned; particularly they must possess the ability to execute wholeheartedly policies and orders which, though they may have been instrumental in forming them, they have not themselves set. In addition they must possess training and knowledge in their own special fields and must keep in step with progress. Here, in the caliber of his chief executives, the administrator finds his strongest tool.

Important among these lieutenants of the health officer is his chief public health nurse. Where questions of public health nursing are involved the health officer naturally turns to her for aid and advice. To her he gives the responsibility of translating the policy of the department into public health nursing routines and methods which will lead to practical accomplishment. She works out the details of *how* the thing is to be done and brings back to him the report concerning *what* has been done. In matters of staff administration such as assignments, working conditions, staff education and discipline, the widest authority is usually delegated to her by the health officer. She in turn keeps him informed of developments and accomplishments and often seeks his counsel and approval. The relationship between health officer and chief nurse must be founded on mutual trust and respect and, as has been stated before, their aims in public health work must be identical.

* Read at a Joint Session of the Health Officers and Public Health Nursing Sections of the American Public Health Association at the Sixty-first Annual Meeting in Washington, D. C., October 27 1932.

To arrive at complete understanding it is necessary that there be a feeling of free communication between the administrator and his executives. The health officer, busy and hard pressed for time though he be, holds himself accessible to his chief nurse practically at all times, and she should feel that any troublesome question or any doubt about policy or even a particularly vexatious case may be brought to him for help in its solution.

The health officer likes to feel that not only the heads of staff, but all staff members, look to him for counsel in certain individual matters. Though the staff nurse is expected to take up all matters of policy and discussion of individual cases with her immediate superiors she should also always feel welcome to see the health officer when unusual and important questions concerning herself in relation to the department arise.

To attend an occasional staff nurses' meeting is a pleasant duty of the health officer. It gives him the opportunity of becoming acquainted with some of his field representatives at first hand, and serves to establish a spirit of friendliness. In large organizations particularly the personal contact of staff worker with health officer, which is only afforded by his attending staff meetings, is invaluable in maintaining a feeling of unity and solidarity within the department. Though his purpose in attending may have been to bring encouragement and perhaps the knowledge of new developments to the field nurses, he often is himself stimulated by the interested response shown by an alert and enthusiastic group of public health nurses who are eager to hear of new developments and new knowledge in the field of their endeavor, and on whose devotion to the common cause he knows he can depend.

Since public health nursing is not an isolated activity but is intimately interrelated with practically every aspect of modern public health, the public health nurse is expected to understand, in addition to her nursing technics, something of the principles, procedures, and objectives of every phase of public health.

Often, indeed, it is the nursing personnel who must carry out the program of related divisions. A bureau of child hygiene or a bureau of tuberculosis control is inconceivable without the public health nurse; yet it is generally recognized that good administrative practice requires a separate nursing division in a public health organization from whose personnel assignments are made to other divisions. To keep things running smoothly a friendly and understanding spirit of coöperation and mutual esteem between the nursing staff and other department workers must prevail.

The health officer as an administrator is vitally interested in qualifications and professional standards for all health workers. It is becoming more and more generally recognized that the nurse in public health requires special training and study. There are in the United States about 16 universities or schools of recognized standing which offer courses to graduate nurses in public health nursing. We have emerged from the time when each organization had to train its own personnel, though it is still true that many of the most excellent nurses in the field today got their public health training in the school of experience. The time has pretty well arrived when no nurse should be accepted for public health assignment without practical academic training in a recognized school. To foster this movement toward better trained public health nurses is an obligation of every health administrator.

The relationship between health officer and public health nurse is one of interdependence. She is his arm which

reaches every individual in the community, even the most humble. But for her many of the most important functions of the public health movements would fail. On the other hand, the public health nurse has a right to look to him for leadership, for program, for support. Theirs is a common devotion to human welfare.

SUMMARY

1. The aims of the public health nurse and the health officer must be identical for good work; on the health officer rests the responsibility of setting the aims and policies of the department.

2. In planning a public health nursing program he is aided by his nursing staff, which carries to accomplishment, as far as possible, the policies and plans of the health officer.

3. The detail of public health nursing methods and routines as well as most details of staff administration are responsibilities delegated to the chief nurse.

4. The health officer should be easily accessible to the chief nurse and, when occasion warrants, to other members of the nursing staff.

5. His attendance at an occasional staff meeting is stimulating both to him and to the nurses.

6. A close feeling of understanding and mutual helpfulness must exist between the nursing division and all other branches of the health department.

7. The administrator in public health recognizes his obligation to support and further the movement to elevate the professional standards of public health nurses.

8. The relationship between health officer and public health nurse is one of interdependence.

Textile Work and Normal Childbirth

TWO studies were made recently, each in a separate district of Bavaria, of the relation between textile work and normal childbirth. The studies were concerned with 3,300 women and about 7,400 pregnancies. Two-thirds of the women were selected among textile workers and one-third for the purposes of comparison from other industries. The women textile workers showed a greater frequency of abnormal births, particularly premature births; anemia, rickets, and pelvic disorders were also more frequent among them. These differences were attributed to the effects of occupation because the general circumstances of the women in the two groups of cases were very similar. Among the occupational factors in the textile industry that were considered harmful to the women, the report mentions the posture and certain movements during the work, such as bending, lifting of weights, overstretching; the general strain of the work, particularly harmful during the second half of pregnancy, and the continuation of employment almost up to the time of childbirth were other factors. It is considered that this last fact may very well produce premature birth. Therefore, the author of the report recommends that the work be discontinued not later than 4 weeks before the expected birth, and that a rest period of at least 6 weeks be given after confinement.—*Soziale Praxis,* Berlin, 52, 1932.

Frozen Vegetables*

ROBERT P. STRAKA AND LAWRENCE H. JAMES, F.A.P.H.A.

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IN a previous report[1] the writers recorded results obtained with tin containers and cardboard boxes (Peters' Type) containing frozen peas, some of which were inoculated with *Clostridium botulinum spores*. In those studies 14 tin and 9 cardboard containers were shown to have botulinus toxin after defrosting and holding at room temperature (80–90° F.) for 3½ days. No toxic materials were obtained in containers which had been immediately defrosted or in those placed in an ice box (50–60° F.) and held for 3½ days. This report deals with a similar study of hand-shelled peas which had been frozen in 16-oz. commercial glass jars.

A detailed discussion of the preparation of the raw materials, the technic of inoculation and packing, the methods of handling, freezing, transportation and storage, the laboratory examination, and the technic for the final identification of the toxin are contained in the previous report.

Each test condition included at least 16 containers. More than 320 glass containers were prepared.

Buffer suspensions of a mixture of dried spores** of 4 strains of *Cl. botulinum*, 2 Type A and 2 Type B, were used in the inoculations (for details, see p. 476–477, previous report).

Each series was prepared in triplicate. The first, not inoculated, served as controls; in the second, each filled container was inoculated with less than 100 botulinus spores; and in the third with approximately 100,000,000 spores.

Although the filled, inoculated and sealed jars of peas were frozen slowly in a refrigerated room at 10° F., not one was cracked or broken.

While holding the containers at room temperature under the various test conditions, it was often found advisable to make a small opening in the metal lid as pressure developed, similar to the procedure sometimes followed with the tin containers (see previous report). The temperature in the ice box used for defrosting and holding some of the jars ranged between 50° and 60° F.

Before discussing the results in detail it should be emphasized that toxin was obtained only in the defrosted samples of peas that had been held at room temperature, and that all of these were definitely spoiled. No toxin was obtained from containers defrosted and examined immediately or from containers defrosted and held in an ordinary ice box. In these respects the results obtained with the glass jars are identical with those obtained with the tin and cardboard containers.

Seventy-two glass containers of frozen peas were examined; 24 had received no inoculation, 24 the dilute inoculum, and 24 the concentrated.

* Read before the Food and Nutrition Section of the American Public Health Association at the Sixty-first Annual Meeting in Washington, D. C., October 24, 1932.

† Food Research Division Contribution No. 162.

1. Straka, R. P., and James, Lawrence H. A Health Aspect of Frozen Vegetables. *A.J.P.H.*, 22, 5:473–492 (May), 1932 (any reference to "previous report" refers to this publication).

** The dried spores were prepared by Elizabeth W. Sommer, William Hooper Foundation for Medical Research, San Francisco, Calif.

TABLE I

BOTULINUS TOXIN AND CULTURES FOUND IN THAWED PEAS PREVIOUSLY FROZEN IN GLASS CONTAINERS

Jars Examined		*Jars Containing Toxin*			*Jars Containing Cultures*	
Total Containers	*Inoculation*	*Number*	*Per Cent*	*Type of Toxin*	*Number*	*Per Cent*
24	None	1	4.16	Type B	8	33.3
24	Dilute	3	12.5	Type B	11*	45.8*
24	Concentrated	5	20.8	Type B	24*	100.0*

* Presumptive. The cultures isolated from these containers have not been identified or typed, since such information would add little to the results obtained.

Each of these lots was subdivided so that samples were defrosted according to each of the 4 methods described.

During the holding and thawing period at room temperature, 9 containers which showed definite signs of spoilage, became toxic. These included 1 uninoculated control, 3 that had received a dilute inoculation, and 5 that had received a heavy inoculation. Seven other uninoculated containers yielded *Cl. botulinum* cultures. The results are summarized in Table I.

In the previous studies the results showed that the method of defrosting and holding in a thawed condition materially influences the development of the toxin. The results when the glass containers are considered from the standpoint of different methods of defrosting and storage are also interesting. The 72 containers referred to in Table I are classified in Table II according to their treatment following defrosting. As in the tests with the tin and cardboard containers, toxin was obtained in some of the samples held at room temperature, whereas no toxin was present in those defrosted and examined immediately, or in those held in the ice box after defrosting.

The tests for total anaerobic bacteria and total anaerobic spores showed that in almost all containers the cells far outnumbered the spores. The length of the period of holding at warm temperatures after defrosting, of course, influenced these counts. Table III shows the results obtained on the uninoculated glass containers. Studies so far have not covered those blanched in brine.

Duplicate containers for each test condition have been examined. Each

TABLE II

INFLUENCE OF METHODS OF DEFROSTING AND HOLDING PEAS ON DEVELOPMENT OF TOXIN

Jars Examined		*Toxic Containers Obtained Under Various Methods of Defrosting and Holding*			
Total Containers	*Inoculation*	*Water Bath at 110° F. Not Held*	*Ice Box (50°–60° F.) Held 3½ Days*	*Room Temperature (80°–90° F.) Held 3½ Days*	*Water Bath at 110° F. Boiled in Brine. Held Room Temperature 3 Days*
24	None	0	0	0	1 (4.1%)
24	Dilute	0	0	3 (12.5%)	0
24	Concentrated	0	0	4 (16.6%)	1 (4.1%)
Totals					
72		0	0	7 (9.7%)	2 (2.7%)

TABLE III

ANAEROBIC COUNTS, pH, AND CL. BOTULINUM IN UNINOCULATED GLASS CONTAINERS DEFROSTED BY EACH OF FOUR METHODS

Sample No. and Method of Defrosting	*Method of Preparation*	*pH*	*Bacterial Counts*		*Cl. botulinum Demonstrated*	
			Anaerobes	*Anaerobic Spores*	*Dilution*	*Culture Type*
28 A	Wash cold	6.6	100	0	1–10*	A
28 B	water	6.7	10	10	1–10	A
31 A	Blanch hot	6.8	1,000	0	1–10*	A
31 B	water	6.8	100	0	....	..
43 A	Blanch hot water	6.7	10	0	1–10*	A
43 B	Vacuum packed	6.7	10	0	....	..
28 C	Wash cold	6.2	10,000	0	0	..
28 D	water	6.0	10,000	0	1–10*	B
31 C	Blanch hot	5.0	100,000	0	....	..
31 D	water	5.0	1,000	0	....	..
43 C	Blanch hot water	4.7	100	0	....	..
43 D	Vacuum packed	4.7	10,000	0	....	..
28 E	Wash cold	4.8	1,000	0	....	..
28 F	water	4.8	0	0	....	..
31 E	Blanch hot	4.3	0	0	....	..
31 F	water	4.4	0	0	....	..
43 E	Blanch hot water	4.3	10,000,000	0	....	..
43 F	Vacuum packed	4.2	10,000,000	0	1–10*	A
28 G	Wash cold	6.4	10	0	....	..
28 H	water	5.0	100	0	....	..
31 G	Blanch hot	5.4	100,100	0	....	..
31 H	water	5.8	1,000,000	10	?	A
43 G	Blanch hot water	6.2	1,000,000	0	....	..
43 H	Vacuum packed	6.0	10	1,000	1–100	†

* Demonstrated in anaerobic count tubes, not spore count.
† Culture isolated was Type A, while the toxin in the container was Type B.

container number has received a letter in accordance with the method of defrosting and storage, as follows:

1. Water bath—2 hrs. (109.4° F.), A and B
2. Ice box—3½ days (50–60° F.), C and D F.), E and F
3. Room temperature—3½ days (80–90°
4. Water bath—boiled—held room temperature (3 days), G and H

As indicated in the previous report, botulinus isolations from the uninoculated containers were made from the spore count series of beef tubes, where possible, otherwise from the anaerobic count series.

Of the 24 uninoculated containers examined, cultures of *Cl. botulinum* were obtained from 8. The relation between the type of cultures present and the methods of preparation and defrosting of these are shown in Table IV. Cultures were isolated from 3 in which the peas had not been blanched and from 5 in which they had been blanched.

It is significant that 7 of the 8 cultures obtained were type A, while, as given in Table I, all of the 9 containers showing toxin had Type B.

Table V shows the relation of type and strength of toxin to inoculation and methods of preparation and defrosting. It is interesting that toxic samples were obtained in peas which had been blanched in hot water as well as in those that had only been washed in cold water. The majority of the toxic containers were samples that had been stored at room temperature without cooking.

TABLE IV

TYPES OF CL. BOTULINUM CULTURES OBTAINED FROM UNINOCULATED GLASS CONTAINERS DEFROSTED BY VARIOUS METHODS

Sample Number	Method of Preparation	Method of Defrosting	Botulinus Cultures Isolated		
			Type	Dilution Count	
28 A	Washed cold water	Water bath 110° F.	A	10*	
28 B	Washed cold water	Water bath 110° F.	A	10	
28 D	Washed cold water	Ice box	B	10*	
31 A	Blanched hot water	Water bath 110° F.	A	10*	
31 H	Blanched hot water	Boiled brine, room temperature	A	10	
43 A	Blanched-vacuum packed	Water bath 110° F.	A	10*	
43 F	Blanched-vacuum packed	Room temperature	A	10*	
43 H	Blanched-vacuum packed	Boiled brine, room temperature	A†	100	

* These cultures obtained from a tube in the anaerobic count series, not from spore count series.
† This container also showed Type B toxin.

TABLE V

RELATION OF TYPE AND M.L.D. OF TOXINS FROM SPOILED PEAS IN GLASS CONTAINERS TO INOCULATION AND METHODS OF PREPARATION AND DEFROSTING

Inoculation	Sample Number	Method of Preparation	Method of Defrosting	Toxin	
				Type	M.L.D.
None	43 H	Blanched hot water	Cooked brine, room temperature	B	2
Dilute	32 E	Blanched hot water	Room temperature	B	10
Dilute	44 E	Blanched hot water	Room temperature	B	10
Dilute	44 F	Blanched hot water	Room temperature	B	1
Concentrated	30 E	Washed cold water	Room temperature	B	20
Concentrated	30 F	Washed cold water	Cooked brine, room temperature	B	2
Concentrated	33 H	Blanched hot water	Room temperature	B	5
Concentrated	45 E	Blanched hot water	Room temperature	B	3
Concentrated	45 F	Blanched hot water			

SUMMARY

1. Seventy-two glass containers of frozen peas, 24 uninoculated, 24 lightly inoculated, and 24 heavily inoculated, were examined.

2. No toxin developed in peas which were examined immediately after defrosting, and none developed in those defrosted and held for 3 days in the ice box.

3. Toxin was obtained from the spoiled peas in 1 of the 24 uninoculated containers, and botulinus cultures were recovered from 8.

4. The spoiled contents of 3 of the 24 lightly inoculated containers were toxic and cultures were obtained (presumptive identification) from 11.

5. The 24 heavily inoculated containers showed 5 to be toxic after spoilage and the organism was recovered (presumptive identification) from every container.

6. All the toxic containers showed Type B toxin.

7. Of the organisms recovered from uninoculated containers, 7 were Type A and 1 was Type B.

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Analyses of Six New York Beers

Weight per cent by Volume

Sample	Total Solids Per Cent	Ash Per Cent	N. Per Cent	Protein Nx6.25 Per Cent	Alcohol at 20° Per Cent	Carbohydrate as Starch Per Cent
A Light	6.14	0.110	0.0775	0.485	3.10	5.12
B Light	6.00	0.155	0.0818	0.511	3.34	4.45
C Light	5.75	0.156	0.1060	0.655	2.86	3.56
D Dark	4.04	0.148	0.0631	0.394	3.34	3.22
E Dark	4.92	0.190	0.0872	0.545	2.78	3.78
F Dark	5.55	0.158	0.0734	0.459	3.82	4.16

FOOD VALUE

One pint beer contains 470 c.c. liquid. One gram of protein or carbohydrate yields 4 calories. One gram alcohol if utilized for energy yields 7 calories.

One Pint	Gms. Protein	Gms. Carbohydrate	Gms. Alcohol	Alcohol Calories	Nutrient Calories	Total Calories
A Light	2.28	24.00	14.57	102	105	207
B Light	2.40	20.90	15.70	110	93	203
C Light	3.12	16.70	13.44	94	79	173
D Dark	1.85	15.15	15.70	110	68	178
E Dark	2.56	17.80	13.06	91	81	172
F Dark	2.16	19.55	17.95	126	87	213
Ave. for 3 lights	2.60	20.53	14.57	102	92	194
Ave. for 3 darks	2.19	17.50	15.57	109	78	188
Ave. for lts. & darks	2.39	19.01	15.14	105	85	191

Mineral Analysis.—Qualitative examination showed the following elements absent, As, Cu, Al, Zn; a trace of iron Ca, Mg, K, Ma, present. Also considerable PO_4.

The most common comparison concerning which we have inquiries is as to milk. Sherman gives 314 calories to the pound of milk. It will be seen by the above that 6 beers average 191 calories to the pint; that is, not quite 2/3 the value of the pint of milk so far as calories go.—Walter H. Eddy, M.D., Teachers College, Columbia University, New York, N. Y.

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Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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A TRIUMPH FOR PUBLIC HEALTH

THE City and County of San Francisco proudly chalks up another victory for the modern concept of public health. The question of a safe milk supply has been settled by the passage of a model milk ordinance.

In 1928 the Board of Health, at that time an executive body, passed a resolution setting January, 1933, as the time when all milk coming into the City and County of San Francisco should be from tuberculin tested herds. In November, 1932, an ordinance was presented to the Health Committee of the Board of Supervisors to make this resolution effective. In addition to requiring all milk to be from tuberculin tested cattle, the ordinance required all milk which was not certified to undergo pasteurization, and further that milk used for cream separation should comply with the specifications for Grade A market milk.

Since 1912 compulsory pasteurization has been in effect for 98 per cent of the milk supply, the few exceptions being certified and guaranteed raw. Certified milk is produced under the supervision of the Milk Commission of the San Francisco County Medical Society. Guaranteed raw milk is tuberculin tested and has a bacterial count of not over 10,000 per c.c. but is not certified. In the opinion of the Director of Public Health the inspection service given this guaranteed raw was insufficient. It did not measure up to the certified standard of inspection and the guarantee was in name only.

Dealers in certified milk had reduced the price from $.25 to $.17 per quart, but guaranteed dealers had not followed suit and were getting more than was originally charged for certified milk. One of their principal objections to submitting to certification was the increased cost of production.

The milk supply of San Francisco comes from 340 dairies and amounts to 50,000 gallons per day. This entire supply was pasteurized with the exception

of 500 gallons certified under the Milk Commission of the County Medical Society and 455 gallons from the guaranteed raw milk dealers.

The Health Committee voted against the ordinance 2 to 1 but a minority report by the chairman of the committee brought the ordinance before the Board of Supervisors as a whole. For 20 weekly meetings, over a period of 5 months, arguments for and against were heard. Various protests and arguments were heard from the National and the California Natural Milk Producers Associations. These long-drawn-out and often inaccurate dissertations were fortified by personal accusations against the integrity of the Director of Public Health and his staff of milk inspectors. A mythical milk trust was painted as a *bête noire* threatening the future price of milk. This threat was based on the plea of one man who produced 50 gallons a day and who alleged that the elimination of his product would inevitably produce a monopoly. Women's clubs, civic organizations, the County Medical Society, and the Health Advisory Board, now an advisory committee, were all solidly behind the ordinance when finally the opponents of the measure gave up trying to wear down its sponsors and permitted a vote to be taken. The measure passed and the opponents had not gained a single vote.

On May 1 the measure passed its second reading and became effective May 15. The clause in reference to milk for cream separation has a 60-day delay before becoming operative.

San Francisco is to be congratulated on the fact that its Board of Supervisors is willing to listen to expert advice, and recommendations not based on commercial motives in passing laws which safeguard the health of the citizens and the children of San Francisco.

DIFFERENTIATION OF HUMAN FROM BOVINE TUBERCLE BACILLI

A TIMELY warning concerning the use of the rabbit as an animal for the differentiation of the bovine and human types of the tubercle bacillus has been given by Cobbett.[1] It will be remembered that in Koch's memorable address at the London Congress on Tuberculosis, in 1901, he said that the proper method of differentiation was inoculation of the bovine animal, and in the first experiments, those done at the State Live Stock Sanitary Board of Pennsylvania, a grown cow and calves were used. Necessarily the expense was heavy, and it was a great relief to bacteriologists to find that the rabbit was almost as good an animal for the differentiation of these two types of organism as cattle. Since that time, the work, as far as animal inoculation goes, has been done largely with rabbits. Dr. Cobbett considers that we have assumed too much regarding the immunity of the rabbit toward the human type of the tubercle bacillus, and points out that general infections do take place, and the animals sometimes die. The immunity is therefore only relative.

He gives an interesting description of the two types of tuberculosis seen in rabbits following inoculation with the human strain of the bacillus, and ends by warning experimental workers that they must recognize " (a) an extensive mild type of tuberculous peritonitis with some degree of miliary tubercle of the lungs in rabbits which have been injected intraperitoneally with human strain, and

(b) occasionally severe progressive lesions in various organs, particularly testes and joints but sometimes also lungs." If any doubt should arise, further inoculation experiments may be necessary to arrive at a definite conclusion.

This work has raised certain interesting questions. The extensive work of Villemin in 1865 was done with tuberculous material from various sources, the bacillus not having been isolated at that time. In other words, it is almost certain that mixed cultures were used, and there are certain diseases, tetanus for example, in which often a mixed culture produces more decided effects than a pure one. However, Villemin unquestionably produced tuberculosis in rabbits by the use of human material, and decided from his experiments that tuberculosis in whatever form or in whatever animal found, was one and the same disease. In his first experiment he inoculated 9 rabbits with human material, and produced tuberculous lesions in all. Later and more extensive experiments confirmed his results, but he found that bovine material was much more virulent for rabbits than human. He even said that bovine tubercle was virulent for rabbits, human for guinea pigs.[2]

In 1882, Koch gave his memorable address on the etiology of tuberculosis, using pure cultures for his inoculation experiments. In Experiment 11,[3] he obtained generalized tuberculosis in rabbits by the injection of cultures from several sources, one obtained from human lungs, and one from spontaneous tuberculosis in a monkey, which was probably of human origin. The injections were made by several methods.

The question arises "How did these infections take place?" There can be no question that the observations were accurate. Did Villemin and Koch accidentally obtain organisms of the human type of greater virulence than usual, or had the subjects from which the material, in the one case, and the cultures in the other, were obtained been originally infected with tuberculosis of the bovine type? It is an interesting question for you to speculate upon.

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CONSERVATION OF WATER

WITHOUT proof, we accept the fact that good water is essential to the individual and the community. We must have it to maintain life and habitable surroundings; therefore, it is proper that such water procurement plans as are deemed necessary should be carried through to successful conclusions. Yet, how often have municipalities been forced to go great distances at large expense for an adequate supply of good water when a much closer source would have been available if only it had been preserved and protected in such manner as to keep it suitable for consumption! Quite a number of instances of this kind can be recalled.

Misuse of a supply of good water today may mean regret tomorrow. Changing conditions sometimes bring about sudden growth in cities which forces the augmenting of the public water supply. Hence, today is the time to look ahead to

future needs. Such foresight and the good effects usually resulting therefrom will often save a good water supply which later would have to be allotted to lower uses on account of earlier misuse.

This country has been criticized as being a profligate one. In our use and misuse of our great natural resource—water—this is probably just criticism. It is strange that this is true for we have had the benefit of the experience in other countries, such as England.

Today, when the keynote is economy without sacrifice of real efficiency, it behooves us to stop and take stock of our water resources. Maryland, a state which in the past has given but little attention to the quantity of water flowing out of and over its territory, has recently created a Water Resources Commission to study the underground and surface supplies with a view to formulating plans for their preservation, allocation, control, and regulation. Other states have been working on such a program for some years but many have done nothing. In those states, now is the time to act—before denser populations with more extensive use and abuse further complicate the problems.

We must have good drinking water. Why not preserve and protect what is now available?

THE WESTERN BRANCH MEETING

THE Fourth Annual Meeting of the Western Branch of the American Public Health Association was held in Pasadena, Calif., May 29, 30 and 31. It was the largest meeting held up to date, there being more than 500 registrations, and almost as many visitors in attendance. Unfortunately very few of the eastern members could be present.

The scientific program was full and well selected, more than 30 papers having been presented. A resolution was passed unanimously asking the parent society, the American Public Health Association, to meet in Southern California in a joint session in the fall of 1934. It is about time for the Association to meet in the West again and it is to be greatly hoped that this plan can be carried out.

Dr. J. L. Pomeroy, of Los Angeles, was inducted as President, and Dr. Walter H. Brown, of Palo Alto, was made President-Elect.

Sixty-second Annual Meeting of the American Public Health Association, Indianapolis, Ind., October 9–12, 1933, Headquarters, Claypool Hotel

Indiana World War Memorial as Seen from the Top of the Federal Building in Indianapolis

ASSOCIATION NEWS

INDIANAPOLIS—OCTOBER 9–12

Some of the Places of Scientific Interest which Delegates to the Annual Meeting Will Visit

THE local Committee in charge of arrangements for the Association's Sixty-second Annual Meeting is planning an extensive program of inspection trips, since there is much to interest health workers in Indianapolis.

Everyone will wish to spend some time at the Indiana University Medical Center. This occupies a 40-acre tract of land, and includes the following units: The School of Medicine, the Training School for Nurses, the Robert W. Long Hospital, the James Whitcomb Riley Hospital for Children, the William H. Coleman Hospital for Women, and the School of Dentistry, the building of which is under construction at the present time. In November, 1931, the Indiana Rotary Convalescent Home for Children was opened and is regarded as a unit of the James Whitcomb Riley Hospital for Children. All of the above hospitals are state hospitals under the control of Indiana University.

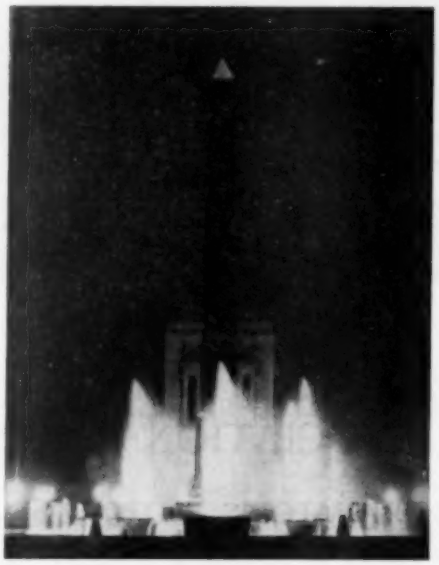
The Indiana University School of Medicine was organized at Bloomington in 1903. In 1907 the Indiana University School of Medicine and the State College of Physicians and Surgeons united under the name of the Indiana University School of Medicine. In 1908 negotiations were completed whereby the Indiana Medical College was united with the Indiana University School of Medicine under the name of the latter and in 1909 an act was passed by the legislature authorizing the Trustees of Indiana University to

conduct a Medical School in Marion County at Indianapolis. The first year of the four years' medical course is given only at Bloomington and the last three years are given only at Indianapolis. The enrollment in the past few years has averaged approximately 100 in each class.

The Indiana University Training School for Nurses is housed in the Ball Nurses' Home. Including affiliate and post-graduate students, the enrollment is approximately 200.

The Robert W. Long Hospital, opened in 1914, is a general hospital built especially to serve patients of the rural and small town districts of the state where hospital facilities are not available. The normal capacity of the Long Hospital is 107 beds, 18 of which are in private rooms. An extensive out-patient service is conducted. Private cases, full-pay ward, part-pay ward, and charity cases are accepted at the hospital. The Long Hospital is maintained by means of a state appropriation and by patients' fees.

The James Whitcomb Riley Hospital for Children, opened in 1924, accepts patients from the state whose parents are financially unable to provide for hospital care. Each child admitted to the hospital must be committed to the hospital by the Judge of the County in which the parents have established legal residence, and the cost of the care and treatment of the patient is paid by that County. The hospital also receives a small state appropriation. An extensive out-patient service is extended to those patients not requiring hospitalization. Two major additions have been made to the Riley Hospital since its opening: In January, 1930, the Kiwanis Wing, the gift of the Kiwanis Clubs of the state, was opened to patients. This ward has a capacity of 50 beds and is devoted to the care of orthopedic cases. In November, 1931, the Indiana Rotary Convalescent Unit, the gift of the Rotary Clubs of the state, was opened for patients. The Convalescent Unit, having a capacity of 60 beds, is located adjacent to the Riley Hospital and offers a most beneficial service to the patients of the Riley Hospital.



Obelisk and Illuminated Fountain in the Indiana World War Memorial Plaza, Indianapolis, Ind.

The William H. Coleman Hospital for Women, opened in 1927, is devoted to the care of obstetrical and gynecological cases. The service of this hospital is extended to the state, and private cases, full-pay ward, part-pay ward, and charity cases are accepted. The normal capacity of the Coleman Hospital is 103 beds, which includes 35 bassinets. Twenty-seven of the adult beds are in private rooms. An out-patient department is conducted. In addition to the regular clinics, a Well-Baby Clinic is conducted. The maintenance of the Coleman Hospital is provided by a state appropriation and patients' fees.

If the cordial invitation of the Indianapolis Water Company to inspect

its various plants is accepted, delegates will see the unusual picture of a slow sand and a rapid sand filter plant handling the same raw water.

Both the main filter plant and the main pumping station of the Indianapolis Water Company are located close to the downtown section of the city and can be reached by motor within 15 minutes.

Indianapolis pioneered in the United States with filter plants. In 1904, when the slow sand filters were placed in service, filter plants had not been installed in St. Louis, Detroit, Washington, Philadelphia, Pittsburgh, and many other principal cities. Now entering the 30th year of their continuous service, all 6 units of the slow sand filter are giving very satisfactory operating results.

The rapid sand filter plant was installed in 1926. Each of the 6 units has an area of 721 square feet. Both the rapid and the slow filters handle water that has undergone preliminary treatment.

Public health engineers and members of the Laboratory section will find especially interesting:

The method of unloading, storing, and feeding of coagulants, involving the use of conductivity recording equipment.

A new plant for handling liquid chlorine in ton containers.

Equipment for applying ammonium sulfate in taste control.

Many unusual devices in the control laboratory.

The laboratory at the company's filter plant was started in 1903. At present the routine involves the handling of about 50,000 samples of water annually, ranging from the raw water through all stages of treatment to various points in the distribution system.

Since 1904, when the present system of safeguarding the city's public water supply was completed, the U. S. Public Health Service has never failed to certify Indianapolis water.

An inspection of the sanitary district of Indianapolis will prove interesting to delegates.

The Sewage Treatment Plant was put into service in 1925. It consists of the following units or processes:

1. Grit Chambers. One main, three-channel, one two-channel and two three-channel grit chambers all fitted with bar racks and, the larger ones, with grease skimmers. They are located ahead of inverted siphons at river crossings and deliver, through conduits, to a common channel entering the clarification plant.

2. Clarification Plant. The fine screens have 1/16″ x 2″ slotted openings. Three screens operate in each channel. Sewage entering them is discharged at the end. Solids, larger than the openings, are left behind in the channel and carried out to sedimentation basins by one-third of the sewage flow, two-thirds of it having passed through the screens. The screens act as concentrators, none of the material being removed on them. The sludge from the rectangular settling basins is pumped to the digestion pits.

3. Activated Sludge Plant. The first spiral circulation in America was at Indianapolis. Since the Indianapolis plant went into service, it has been general practice to include this feature. The settlers are circular. The mechanism was designed by the engineer without the use of patented features. The plant treats about 70 per cent of the sewage flow. At the time of construction, insufficient money was available to build a larger plant. Its completion has been under consideration for some time. Unusual methods of operation have been used to relieve the river as much as possible.

4. Sludge Disposal. Both primary and activated sludge are digested in open pits about 300 feet square and 10–14 feet deep. No drying beds are provided. The wet sludge is used on market gardens, being applied in the winter so that freezing disintegrates it. The partially equipped dehydration unit was operated for six months in 1931 but is idle on account of lack of money to complete and operate it.

5. The Garbage Disposal Plant is operated by the same Board and is located adjacent to the Sewage Plant. Garbage is collected weekly in winter and bi-weekly in summer in motor drawn trailer trains and delivered to a receiving pit at the plant. Conveyors deliver it to the pressure cookers in which it is cooked

for 2.5 hours at 80 lb. pressure. The free grease is drawn off and the mass drained and dried in the cooking tank under vacuum. The finer, lighter part of the dried tankage is separated by the use of an air current and sold for feed. The residue is percolated to recover the grease, after which it is sold as fertilizer. The grease is sold for soap making and represents the most valuable part of the by-products.

Members will have the opportunity to visit the extensive laboratories of Eli Lilly and Company. The group of 25 major buildings covers several city blocks and comprises scores of departments. In addition, biological laboratories, with commodious horse stables and comfortable quarters for small animals, are maintained on a farm 20 miles east on the National Highway.

Research primarily directed to the discovery of new and better therapeutic agents or the improvement of those now in use is conducted throughout the year at the Indianapolis laboratories of the company, and the biological plant. The personnel of the scientific division has grown, since it was first organized in 1886, until now it includes over 70 research workers trained in chemistry, biology, bacteriology, physiology, pharmacology, and experimental medicine. Approximately 40 of this corps devote their entire time to research problems. The Lilly research staff is in constant coöperation with investigators in universities, clinics, and hospitals in the United States and in many foreign countries.

The above represents only a few of the interesting possibilities in Indianapolis.

The Local Committee will have further plans to report in the next issue of this Journal.

ANNOUNCEMENT OF THE 1933

Inter-Chamber Health Conservation Contest

THE CHAMBER OF COMMERCE OF THE UNITED STATES *hereby announces the fifth inter-chamber health conservation contest in conformity with a resolution adopted at its 17th annual meeting.*

The PURPOSE of this contest is to interest the business man in public health and thereby assist in the intelligent fostering and promotion of sound public health practices.

The ENROLLMENT procedure consists of the filling out of the attached entry blank by the secretary of the local chamber of commerce and the forwarding of it to the Insurance Department of the Chamber of Commerce of the United States at Washington, D. C.

The only REQUIREMENT for enrollment is that a community's local chamber of commerce be affiliated with the National Chamber.

The FACT-FINDING SCHEDULE is the form upon which cities are graded and this is due in Washington on or before March 1, 1934.

Further data on the Contest are available either from the Insurance Department, Chamber of Commerce of the United States, Washington, D. C., or the Committee on Administrative Practice, American Public Health Association, New York City.

May 25th, 1933.

Early Enrollment Preferably by July 1 will be to the Advantage of Your City!

INDIANAPOLIS HOTEL RATES

Hotel	Room Capacity	Single Room		Double Room	
		Without Bath	With Bath	Without Bath	With Bath
Antlers Hotel	250	....	$2.00–$3.50	....	$3.50–$6.00
Brevort Hotel	175	$1.00–$1.50	1.50– 2.00	$1.75–$2.25	2.50– 3.50
Claypool Hotel	600	....	3.00– 5.00	....	4.50– 8.00
Denison Hotel	200	1.25– 1.50	1.75– 3.00	2.00– 2.50	3.00– 5.00
Graylynn Hotel (apartment hotel)	150	....	2.00	....	3.00
Hotel Eastgate	100	1.00– 1.25	1.50– 2.00	2.00– 2.25	2.50– 3.00
Hotel Edward	30	1.00	1.50	1.50	2.00
Hotel English	250	1.25	1.50– 2.50	2.00	2.50– 3.50
Hotel Harrison	...	1.50– 2.00	2.50– 3.50	2.50– 3.00	3.50– 5.00
Hotel Lincoln	400	....	2.50– 4.00	....	4.00– 7.00
Hotel Linden	250	1.25– 1.50	2.00– 3.00	2.00– 2.50	3.00– 4.00
Hotel Lockerbie	200	....	2.00– 2.50	....	3.00– 4.00
Hotel Riley	100	1.25 and up	1.75 and up	2.25 and up	2.75 and up
Hotel Severin	400	....	2.50– 3.50	....	4.00– 7.00
Hotel Washington	250	1.50	2.00– 4.00	....	3.50– 5.50
Hotel Williams	150	1.00	1.50– 2.00	1.50– 2.00	2.50– 3.00
Lorraine Hotel	100	1.25	1.50– 2.00	2.00	2.50
The Seville (apartment hotel)	...	....	2.50	....	2.50– 5.00
Sheffield Inn	90	1.50	2.00	2.00	3.00
Spencer House	125	1.25	1.50	2.00	2.50
Spink Arms Hotel	100	....	2.50	....	4.50

.....*(Cut off on this line and mail to the hotel of your choice)*.....

HOTEL RESERVATION BLANK FOR INDIANAPOLIS MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
450 SEVENTH AVENUE, NEW YORK, N. Y.
OCTOBER 9–12, 1933

To .....
(Name of Hotel)

Please reserve for me .....rooms for.....persons for the A.P.H.A. Meeting.

Single room.....Double room.....

Maximum rate per day for room $.....Minimum rate per day for room $.....

I expect to arrive..... If date of arrival is changed I will notify you at least 24 hours in advance.

Please acknowledge this reservation.

Name .....

Street address .....

City..... State.....

NEW MEMBERS

The following list includes applicants who have been approved for membership in the A.P.H.A. by the Sub-Committee on Eligibility. These new members have requested affiliation with the sections indicated, and action by the Section Council will follow.

Health Officers Section

Hubert M. Heitsch, M.D., Pontiac General Hospital, Pontiac, Mich., Director of Public Health

George M. Little, M.D., D.P.H., Red Deer, Alta., Canada, Medical Officer of Health

Harry L. Richardson, B.S., Daytona Beach, Fla., Health Officer

Laboratory Section

Clinton F. Brown, Chemical Laboratory, City Hall, Trenton, N. J., Assistant City Chemist

Public Health Engineering Section

Charles H. Capen, Jr., 8 Florence Pl., West Orange, N. J., Sanitary Engineer, Water Filtration Plant

Bryant W. Richardson, 17 King St., Painesville, O., Design of Sewage Disposal Plants

Carl J. Scheldrup, B.A., City Hall, Albert Lea, Minn., City Health Inspector

Child Hygiene Section

Garner M. Byington, M.D., W. K. Kellogg Foundation, Battle Creek, Mich., Associate Medical Director

Emory Morris, D.D.S., W. K. Kellogg Foundation, Battle Creek, Mich., Director, Dental Education

Lulu St. Clair, R.N., W. K. Kellogg Foundation, Battle Creek, Mich., Director, Health Education

Food and Nutrition Section

Samuel Weiss, M.D., 57 W. 57 St., New York, N. Y. (Assoc.)

Public Health Education Section

James M. Anders, 250 S. 17th St., Philadelphia, Pa., Member, Board of Health

Etta E. Giddens, R.N., 31 Audubon Rd., Boston, Mass., with City Health Department

Theda L. Waterman, R.N., 906 Garland St., Flint, Mich., Executive Secretary, Genesee County Tuberculosis Assn.

Public Health Nursing Section

Lovina R. Chase, R.N., P. O. Box 322, Fishers Island, N. Y., Public Health Nurse

Violet S. Hoar, R.N., W. K. Kellogg Foundation, Battle Creek, Mich., Health Teacher

Florence B. Ryan, R.N., 54 E. Myrtle St., Orange, Mass., Public Health and School Nurse

Epidemiology Section

Roy F. Feemster, M.D., Dr.P.H., Dept. of Public Health, State House, Boston, Mass., Assistant Director, Division of Communicable Diseases

Huldah E. Thelander, M.D., 822–39 Ave., San Francisco, Calif., Assistant in Communicable Disease Department, Children's Hospital

Unaffiliated

James V. May, M.D., Room 109, State House, Boston, Mass., Commissioner, Mass. Dept. of Mental Diseases

John E. Runnells, M.D., Bonnie Burn Sanatorium, Scotch Plains, N. J., Superintendent

Sustaining Member

Life and Casualty Insurance Company of Tennessee, Life and Casualty Bldg., Nashville, Tenn.

DECEASED MEMBERS

Leon C. Havens, M.D., Montgomery, Ala., Elected Member 1920, Fellow 1931

James R. McClintock, B.S., New York, N. Y., Elected Member 1919, Fellow 1922

Lydia Clark, Columbus, O., Elected Member 1928

H. L. B. Coote, M.D., Michigan City, Ind., Elected Member 1915

F. C. E. Mattison, M.D., Pasadena, Calif., Elected Member 1910, Fellow 1930

William C. Cotton, Atwater, Calif., Elected Member 1931

G. Webster Hallett, Osterville, Mass., Elected Member 1929

Dr. Ernest A. LeBien, McHenry, N. D., Elected Member 1931

Irving D. Williams, M.D., New York, N. Y., Elected Member 1919.

APPLICANTS FOR FELLOWSHIP

HEALTH OFFICERS SECTION

John W. Brown, M.D., C.P.H., Austin, Tex.
Joseph Howard Hickson, M.D., New Haven, Conn.
Arthur D. Knott, A.B., M.D., D.P.H., Parkersburg, W. Va.

LABORATORY SECTION

Conrad Kinyoun, A.B., Savannah, Ga.
Walter Leroy Kulp, M.S., Ph.D., Storrs, Conn.
Newton W. Larkum, B.S., Ph.D., Lansing, Mich.

VITAL STATISTICS SECTION

Lloyd Rolland Gates, M.S., D.P.H., Ann Arbor, Mich.
Jessamine S. Whitney, A.B., New York, N. Y.

PUBLIC HEALTH ENGINEERING SECTION

Albert E. Berry, M.A., C.E., Ph.D., Toronto, Ont., Canada
William Roscoe Berry, Norfolk, Va.
Harold Stephens Hutton, C.E., Montclair, N. J.
W. Scott Johnson, A.B., M.S., Jefferson City, Mo.
Willis Taylor Knowlton, B.S., Los Angeles, Calif.
Charles Lundy Pool, S.B., Providence, R. I.
Frank Russell Shaw, C.E., Chicago, Ill.

CHILD HYGIENE SECTION

Mary Ella Chayer, B.S., New York, N. Y.
Joseph F. Paulonis, Ph.G., M.D., Brooklyn, N. Y.
Charles Joseph Prohaska, M.D., Hartford, Conn.
Eldred Victor Thiehoff, M.A., M.D., Cleveland, Ohio

FOOD AND NUTRITION SECTION

Ferd. A. Korff, B.S., Baltimore, Md.
Bernard Emerson Proctor, S.B., Ph.D., Cambridge, Mass.

PUBLIC HEALTH EDUCATION

Mrs. Bertha M. Ashby, B.S., M.S.P.H., Norman, Okla.
George A. Dundon, B.J., Milwaukee, Wis.
Baxter Key Richardson, A.B., Springfield, Ill.
John P. Sullivan, A.M., Ph.D., Boston, Mass.
Carl A. Wilzbach, B.S., M.D., Cincinnati, Ohio

PUBLIC HEALTH NURSING

Ruth P. Carroll, A.A., B.S. in Ed., R.N., Houston, Tex.
Netta Ford, R.N., York, Pa.

EPIDEMIOLOGY

H. Jackson Davis, A.M., M.D., Dr.P.H., Albany, N. Y.
Kenneth Fuller Maxcy, B.A., M.D., Dr.P.H., Charlottesville, Va.

UNAFFILIATED

Bertram Feuer, M.S., Ph.D., Chicago, Ill.
George Henry Roth, M.D., Los Angeles, Calif.
Nicholas Francis Williams, D.V.S., Fort Worth, Tex.

VITAL STATISTICS INSTITUTE PROPOSED FOR 1934

THE Vital Statistics Section of the American Public Health Association, at the suggestion of the Committee on Meetings and Publications, has been studying the desirability of a Vital Statistics Institute at the annual meeting. The Section Secretary, Dr. A. W. Hedrich, has sent a list of proposed subjects to a large number of Vital Statistics Bureaus with a view to determining which were of greatest interest to the membership. The replies were thoughtful and illuminating, and indicated a pronounced interest in the project. For various reasons it has been deemed best to hold the Institute at the 1934 annual meeting.

Meanwhile, the officers are completing plans for a successful annual meeting at Indianapolis, in preparation for which the Section Council has held two meetings thus far. An outstanding feature of this year's meeting will be a joint session with the Health Education Section on the use of vital statistics in health education.

FREDERIC POOLE GORHAM, 1871–1933

FREDERIC POOLE GORHAM died in the garden of his summer home at Glocester, Rhode Island, on June 4. A member of this Association since 1899 and one of its original Fellows, his passing leaves in his associates a sense of the deepest loss.

His influence, exerted unostentatiously in countless directions, has left its permanent impress upon the science of his chosen profession, Bacteriology. Identified with the inauguration of Standard Methods for Water Analysis and Shell Fish Examination, he has been associated with all of their subsequent revisions.

Forty years ago he was appointed to the Faculty of Brown University as a Zoölogist. He soon added to his duties the development of courses in Bacteriology which comprised some of the earliest formal instruction in this subject in this country. At the time of his death he was Professor of Bacteriology and head of the Department of Biology. In the opinion of his colleagues he was one of the great teachers of his generation.

As one of his former pupils, I would add a personal tribute. We were fond of "the Prof.", but, in student days, not cognizant of his effective service in our behalf. We did not then know, as we now perceive, that he was continually working upon his boys and bringing out what might be in them. There was little of "spoon-fed" pedagogy in his graduate courses. Without our knowledge, we were being taught to stand on our own feet, and only in after years has it become apparent with what friendly artistry he did that thing which it is so difficult to do for students.

His interest in his fellow men colored his every activity. Thirty-five years ago he took the first smears for the diagnosis of diphtheria in patients of the health department of his native city, Providence. Dr. Chapin has styled this as the beginning of practical bacteriology in his department. The association of these two scientists in this work was continued until interrupted by death. For the State of Rhode Island he saved the failing shellfish industry by the planned and supervised investigations which resulted in the necessary sanitary reforms. When the milk situation in his community needed scientific attention, Gorham was prevailed upon to take over the work, and he accomplished results which won for him the praise of all concerned. Mosquito eradication he directed successfully; hospital and community welfare projects benefited by his sound judgment and advice; in a truly remarkable way he discharged the civic duties of the individual and exemplified the service of science to the community.

As would be expected of a scientist of such wide interests, Professor Gorham was a member of many learned societies, among which the Society of American Bacteriologists benefited by his services as secretary, vice-president, and president.

It is a fine thing so to have lived that even after death has come one lives on in the affection and esteem of his fellow men. Professor Gorham possessed so many admirable qualities that it is difficult to know which most to admire. Be it his genial smile, his pithy eloquence, his great adaptability, his indefatigable industry, his unfailing interest in mankind, his skill as administrator, organizer, teacher, his keen analysis of problems and equally keen formulation of methods for seeking their solution, his tremendous volume of quiet accomplishment, each and every one of these was a manifestation of his friendliness, enthusiasm, competence and integrity. What more can any man possess and share with his generation? JOHN W. M. BUNKER

EARL MAX PICKENS

EARL MAX PICKENS, A.M., D.V.M., Fellow and Secretary, Food and Nutrition Section, American Public Health Association, succumbed to a heart attack on June 13th, 1933. Dr. Pickens was Professor of Bacteriology and Animal Pathology and Head of the Department at the University of Maryland, College Park. He was 44 years old.

He had long been active in public health work, particularly as related to milk and animal diseases. He was known as a capable investigator, a successful teacher and one who gave much time and thought to state and national health problems. He has been honored by election to responsible offices in several scientific organizations to which he belonged.

The Association has lost an influential member and an ardent supporter. Dr. Pickens' wife and three children survive him.

A NATION'S INVESTMENT IN HEALTH

DR. FRED O. TONNEY, of Chicago, for many years head of the research staff of Chicago and also radio advisor to the Association, is introducing on June 28 a series of radio broadcasts through the facilities of the National Farm and Home Network of the National Broadcasting Company sponsored by the American Public Health Association. The program has been arranged by a committee under the direction of Dr. Louis I. Dublin, past president of the Association, Dr. John A. Ferrell, Dr. Haven Emerson, Dr. Kendall Emerson, and Dr. Fred O. Tonney, together with the active coöperation and help of Mr. Frank E. Mullen of the National Broadcasting Company. The speakers have been carefully selected and the program arranged is as follows:

Date 1933	*Subject*	*Name*	*From*	*Time (Daylight saving)*
June 28	Introduction	Dr. Fred O. Tonney	Chicago	12:35 P.M. C.D.T.
July 5	Water Control	George W. Fuller	New York	1:35 P.M. E.D.T.
July 12	Protection of Milk Supplies	Dr. Chas. E. North	New York	1:35 P.M. E.D.T.
July 26	Reduction in Public Health Budgets	Dr. Kendall Emerson	New York	1:35 P.M. E.D.T.
Aug. 2	To be selected	Dr. Herman Bundesen	Chicago	12:35 P.M. C.D.T.
Aug. 9	Safeguarding Child Life	Dr. George Palmer	New York	1:35 P.M. E.D.T.
Aug. 23	Epidemiology	Dr. George B. Ramsey	New York	1:35 P.M. E.D.T.
Aug. 30	Laboratory Chats	Dr. Fred O. Tonney	Chicago	12:35 P.M. C.D.T.
Sept. 6	Tuberculosis	Dr. Lawrason Brown	New York	1:35 P.M. E.D.T.
Sept. 13	To be selected	Dr. Louis I. Dublin	New York	1:35 P.M. E.D.T.
Sept. 27	Safeguarding Infant Life	Dr. Alfred E. Hess	New York	1:35 P.M. E.D.T.
Oct. 4	Causes and Results	Prof. C.-E. A. Winslow	New York	1:35 P.M. E.D.T.

The committee wishes to take this opportunity to thank Dr. Tonney for the work he has done in arranging and handling the details of this broadcast with the Broadcasting Company and to thank Mr. Mullen for the opportunity given us by the National Broadcasting Company to bring before the public many of the problems of public health and to present them in a scientific and authoritative manner.

PUBLIC HEALTH ADMINISTRATION

Salem, Mass.—This city with a population of 43,353 (1930 census) reports a death rate of 10.9 for 1932. The infant mortality rate has consistently declined from 189 in 1900 to 64 in 1930 and reached a new low figure of 43 per 1,000 births in 1932. Diphtheria prevention clinics have been conducted in the schools but the Board of Health reports that diphtheria is more prevalent than it should be. There were 54 cases with but one death. The Health Department personnel includes, in addition to the Health Officer, one clerk, one physician, one dentist, one inspector of animals, two public health nurses and two sanitary inspectors.

Lynn, Mass.—This city of 102,320 individuals (1930 census) reports a death rate of 10.2 for 1930, slightly higher than that for the preceding year. The health department budget was $51,562.00. There were reported 57 cases of diphtheria with 3 deaths.

Indiana.—The State Board of Health of Indiana, which recently celebrated its fiftieth anniversary and could boast of only 5 health commissioners during that period, has been reorganized and Dr. John H. Hare, a member of the old State Board of Health, has succeeded Dr. William F. King, as Secretary. The work of the maternal and child welfare division has been discontinued except in its strictly educational phase. Laboratory service has been transferred to the University School of Medicine. State support for venereal disease clinics has been withdrawn. The new form of organization provides for closer relation between the State Board of Health, the State University and the State Medical Association.—*Month. Bull.*, Indiana State Board of Health, Apr. 1933.

Venereal Disease Clinics—The New York State Department of Health states that a community should have a clinic when such "community can care for its indigent syphilitics at less cost by providing clinic service than by paying physicians a nominal fee per visit for the medical supervision of such cases." There is need of economic consideration for the care of indigent persons afflicted with syphilis who are apparently applying for medical care in ever increasing numbers. Responsibility for treatment of such individuals rests upon the local boards of health and health officers.

The social hygiene division of the State Health Department is assisting in presenting the need for clinics to county medical societies and county boards of supervisors.—*Health News*, New York State Dept. of Health, May 15, 1933.

Knoxville, Tenn.—This city with an estimated population of 111,930 in 1932 spent $.51 per capita for public health purposes. The per capita expenditure has shown a decrease from $.64 in 1930. The death rate of 12.1 is the lowest on record. A very encouraging report is made of the reduction in the so-called filth-borne diseases including diarrhea and enteritis, which causes have long been prominent in the leading causes of death. Diarrhea and enteritis now stands tenth on the list and is responsible for but 2.4 per cent of all deaths. The annual health report which is multigraphed is very attractively edited and contains numerous

valuable charts, tables and diagrams. The Health Officer has well demonstrated what can be done with the limited appropriation and facilities.

Schenectady, N. Y.—This city reports a death rate of 10.65 for 1932. There has been a general reduction in the number of reported cases of communicable diseases with the exception of mumps, which showed some increase and whooping cough which showed a marked increase. The infant mortality rate was 80 and the birth rate 16. Two deaths were attributed to diphtheria. The annual report contains statistical tables and tabulations on inspections and services rendered in the various divisions of the Department.

Chicago, Ill.—In May, 1914, a comprehensive ordinance was passed creating a Board of Health of 5 members. For many years prior to 1932, according to the ruling of the State Supreme Court, Chicago had been without a legally authorized health department; one which possessed the necessary authority to enforce the health laws and protect its citizens in case of epidemic or emergency. With the advent of the new Board, there has been developed a complete reorganization of the functions and personnel of the department. With a general death rate of 9.8 a new low record has been established. This means that 953 fewer persons died in 1932 than in 1930, the year of previous lowest record. The diphtheria death rate has dropped from 6.2 in 1931 to 1.9 in 1932, a decrease of 71 per cent. During the same time the infant mortality rate has been lowered from 56.4 to 48.8. Chicago continues its unique record for a low typhoid fever rate, that for 1932 being 0.4.

A special educational program was carried on to increase the per cent of preschool children protected against diphtheria. A publicity program included the release of nearly 2,000,000 pieces of literature dealing with diphtheria protection. Field nurses were employed to urge parents to take children to the family physician. The "Birthday File," which now contains nearly 300,000 names, was used effectively, as were the infant welfare stations and the public and parochial schools. One of the special features was a motorized diphtheria prevention clinic which travelled to various areas in the city where the per cent of protection was low.

Prior to the end of the school year in June, 25 physicians and 25 nurses were paid by the Municipal Tuberculosis Sanatorium for school health service but since that date this work has been transferred to the Department of Health and there are now 35 school health officers in the Bureau of Child Welfare. In this bureau there has been an average of 300 nurses engaged during the last 3 months of the year.

There were 565 health talks given during the year by the personnel of the Board of Health, of which 75 were devoted to diphtheria, 47 on child hygiene, 64 on dental hygiene, 16 on food control, 25 for milk control, 112 on laboratory topics and 84 on general sanitation.

LABORATORY

THE USE OF GLYCEROL AS A PRESERVATIVE FOR MILK SPECIMENS TO BE EXAMINED FOR HEMOLYTIC STREPTOCOCCI

RUTH GILBERT, M.D., F.A.P.H.A. (*Life Member*), and M. E. CLARK

Division of Laboratories and Research, New York State Department of Health, Albany, N. Y.

WHEN epidemics of septic sore throat are investigated, samples of milk submitted for laboratory examination may be in transit several days. During this time, in summer particularly, saprophytic strains of bacteria may multiply so rapidly that hemolytic streptococci, if present, are difficult to isolate. The efficient preservative action of glycerol on material containing microörganisms of the enteric disease group[1] and on milk to be examined for *B. abortus*[2] suggested its use also in milk to be examined for hemolytic streptococci.

A one-third volume (approximately 30 per cent) of glycerol of tested purity was added to samples of milk which had been recently collected. The specimens were then inoculated with strains of hemolytic streptococci from cases of septic sore throat. After 7 days at room temperature or 10 days in the refrigerator, the microörganisms could be easily isolated, while they were recovered with difficulty after 24 hours at room temperature from similarly inoculated portions of the milk samples which contained no glycerol. An equal volume of glycerol—50 per cent—proved less satisfactory since, under these conditions, the colonies of streptococci which developed on the plating medium were slightly fewer than those from specimens containing a 30 per cent concentration; 20 per cent of glycerol has usually sufficed to preserve the specimens for 2 days only, when they were kept at room temperature.

During the past 2 years, approximately a one-third volume of glycerol has been added to samples of milk sent to be examined for streptococci; green-producing as well as hemolytic streptococci have been easily isolated from such specimens.

A simple outfit containing a measured amount of glycerol of tested purity is used. By means of a label pasted on the container to indicate the level to which the milk should be added, a 30 per cent concentration of glycerol is secured. After collection, the specimen container should be well shaken to insure thorough mixing of the glycerol and the milk.

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A STUDY OF THE BROM-THYMOL-BLUE REACTION IN FRESHLY DRAWN MILK*

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THE use of indicators in the detection of abnormal milk began with the investigations of Van Slyke and Baker.[1] It was primarily their purpose to detect abnormal or altered market milk and not the detection of milk from diseased udders. The following year Baker and Breed [2] studied various indicators in milk for the detection of mastitis. Within the past few years Stableforth,[3] Rosell,[4] Udall and Johnson,[5] and Hucker[6] have used the brom-thymol-blue reagent in the detection of milk from udders affected with mastitis. Sharp and McInery[7] found the brom-thymol-blue indicator gave such a large error as to make it practically useless. Stableforth[3] in his studies of pH of milk samples as affected by fat content reports, stated that

> From the extract, of the results given in Table II, it can be seen that, taking 3 per cent as a standard, although a variation of 0.5 per cent makes little difference, a variation of 1 per cent so alters the color as to interfere considerably with the accuracy of the test; while one of two per cent makes the test nearly valueless, because a sample might be regarded as normal, doubtful, or abnormal merely according to the percentage of fat.

"Thybromol" outfits, for the detection of milk from quarters affected with mastitis, have recently appeared on the market. These are merely convenient field apparatus using brom-thymol-blue indicator to determine the pH of freshly drawn milk. There has been wide adoption of these outfits by large milk companies in their inspection work and also by a large number of veterinarians in private practice. The present study was made to determine the significance of unexplainable variations of this test, which had been brought to our attention.

The technic used in this work was that recommended by Udall and Johnson,[5] which was adopted by the commercial concerns for their "Thybromol" outfits. The tests were made on the freshly drawn milk from the individual quarters and were recorded as either positive (+), doubtful (±), or negative (−). Positive reactions represent milk of pH 7.0 or alkaline, doubtful approximately pH 6.9, and negative pH 6.5. These groupings were based on the work reported by Hucker.[6]

DATA AND DISCUSSION

The data present the brom-thymol-blue reactions as obtained, over a period of 5 to 6 months at monthly intervals, under three different conditions. These are: (1) The normal or physiological variation of the pH of the milk of mastitis-free animals. All of the infected animals in this herd had been slaughtered 4 years previously; (2) the constancy of positive reactions in naturally infected animals; and (3) the variation from a negative reaction of non-infected animals that are present in an infected herd.

The study of normal variation of the pH of non-infected animals was carried

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out in a disease free (mastitis, tuberculosis, and abortion) herd. Four years previously a complete cleanup was made and all infected animals were slaughtered; this was followed by disinfection and renovation of the barn. During the past 4 years there have been no udder disturbances whatsoever. Very few animals have been purchased and placed in this herd. Bacteriological examinations of the milk and physical examinations were made of the milk and udders, at several weekly intervals, before such animals were released from the quarantine barn.

The results of the brom-thymol-blue reactions of the milk from these mastitis-free animals are presented in Table I. Of the 33 lactating animals there were 7 that showed a variation in reaction of the milk during this study. The reactions of the 26 animals which gave consistently negative (—) tests are not recorded in the table. The data show that a definite and pronounced variation is obtained in the pH of freshly drawn milk from these mastitis-free animals. These positive or doubtful reactions occur sporadically and may change from quarter to quarter in the same cow, e.g., a positive or doubtful reaction may be obtained and then not recur in the same quarter or cow during the period of this study. These variations occurring from time to time in mastitis-free animals demonstrate the limitations of a diagnostic test based on the pH of freshly drawn milk.

To determine the constancy of positive reactions in the milk of infected animals several naturally infected animals were chosen. The results are given in Table II, cows A and B. It will be noted that at each examination streptococci of mastitis were cultured from all four quarters of cow A. The pH reactions showed a progressive reaction and became more positive throughout the period of this study. In only one instance did a positive reaction change to a doubtful and then back to a positive reaction. Cow B presents a slightly different picture since at no time were streptococci of mastitis isolated from her right front and left rear quarters while these streptococci were isolated from the right rear and left

TABLE I

BROM-THYMOL-BLUE REACTIONS OF FRESHLY DRAWN MILK FROM INDIVIDUAL QUARTERS OF COWS IN A MASTITIS-FREE HERD. THE 7 COWS INCLUDED IN THIS TABLE GAVE VARIATIONS FROM A NEGATIVE REACTION; THE 26 COWS NOT INCLUDED GAVE CONSISTENT NEGATIVE TESTS.

Cow No.	*Brom-thymol-blue Reactions on Freshly Drawn Milk from the Individual Quarters*				Month
	RR	*RF*	*LF*	*LR*	
1	±	—	—	—	Nov.
	+	+	—	—	Jan.
	+	+	—	—	Feb.
	—	±	—	—	Mar.
5	—	—	—	—	Nov.
	—	—	+	—	Jan.
	+	+	+	+	Feb.
	—	±	—	—	Mar.
8	—	—	—	—	Nov.
	±	—	—	±	Jan.
	±	—	—	±	Feb.
	—	—	—	—	Mar.
22	—	—	—	—	Nov.
	—	—	—	+	Jan.
	—	—	—	+	Feb.
	—	—	—	—	Mar.
25	—	—	—	—	Nov.
	—	—	—	—	Jan.
	+	—	—	—	Feb.
	—	—	—	—	Mar.
27	—	—	—	—	Nov.
	—	—	—	—	Jan.
	+	+	—	—	Feb.
	—	±	—	—	Mar.
31	—	—	—	—	Nov.
	—	—	—	—	Jan.
	—	—	+	—	Feb.
	—	—	—	—	Mar.

TABLE II

BROM-THYMOL-BLUE REACTIONS OBTAINED IN AN INFECTED HERD. COWS A AND B WERE NATURALLY INFECTED WITH STREPTOCOCCI OF MASTITIS AND COWS C, D, AND E ARE NONINFECTED COWS IN THIS INFECTED HERD.

Cow No.	*Brom-thymol-blue Reactions on Freshly Drawn Milk from the Individual Quarters* RR	RF	LF	LR	Month	*Streptococci*
A	—	±	±	—	1st	all 4 quarters
	±	±	+	±	2nd	all 4 quarters
	+	+	+	+	3rd	all 4 quarters
	+	+	+	±	4th	all 4 quarters
	+	+	+	+	5th	all 4 quarters
	+	+	+	+	6th	all 4 quarters
B	+	—	+	—	1st	in RRandLF
	+	—	+	—	2nd	in RRandLF
	±	—	—	—	3rd	in RRandLF
	+	±	+	±	4th	in RRandLF
	+	—	+	—	5th	in RRandLF
	±	—	—	—	6th	in RRandLF
C	—	—	—	—	1st	None
	—	+	+	—	2nd	None
	—	—	—	—	3rd	None
	—	+	+	—	4th	None
	—	+	+	—	5th	None
	—	—	—	—	6th	None
D	—	±	+	—	1st	None
	—	—	—	—	2nd	None
	—	—	—	—	3rd	None
	—	—	—	—	4th	None
	—	—	—	—	5th	None
	—	—	—	—	6th	None
E	±	±	+	±	1st	None
	—	—	±	—	2nd	None
	—	—	—	—	3rd	None
	—	—	—	—	4th	None
	—	—	—	—	5th	None
	—	—	—	—	6th	None

front quarters at each examination. In studying the brom-thymol-blue reactions it will be observed that in the infected right rear quarter the reaction tending to shift from a positive to a doubtful reaction and did not seem to be settled at any time. In the case of the infected left front quarter the results were very inconsistent, characterized by continually changing from positive to negative. On only two occasions did the two non-infected quarters change from a negative to a doubtful reaction.

The variation from a negative reaction of non-infected animals that were present in an infected herd proved rather striking. Such conditions are found in animals C, D, and E in Table II; these were picked at random from a large number of similar cases in two large herds. During the time these cows have been under the writer's observation no streptococci were isolated from their milk and they were furthermore devoid of any indications of mastitis. Definite positive and doubtful reactions were obtained in testing the milk of these cows; such reactions are misleading unless other tests or examinations are made to assist in making a definite diagnosis.

It is these variations of the pH of freshly drawn milk, using brom-thymol-blue indicator, that have caused concern to the veterinarian and milk inspector in detecting cases of mastitis. To insure confidence on the part of the dairyman in the veterinarian and the milk inspector it is necessary that any test used in the diagnosis of mastitis should not give wide unexplainable discrepancies or variations. Such discrepancies in diagnosis, particularly if they affect the economic condition of the dairyman will cause suspicion and immediate lack of coöperation.

According to the early workers the test is based on the fact or supposition that there is an alkaline exudation or transudation of blood or lymph constituents into the milk due to an injury. Specifically in mastitis the positive reaction is attributed to injury caused by the streptococci of mastitis. The interpretation of a positive reaction becomes less definite and more general when it is noted that apparently physiological

conditions cause a positive reaction. Frequently the abnormality of milk due to infection of mastitis can be detected upon physical examination of the milk as early as by the brom-thymol-blue reaction.

SUMMARY

The data presented seem to indicate that:

1. Apparently there are normal physiological factors that are responsible for a variation in the pH of freshly drawn milk.

2. The test cannot be used alone to detect cases of mastitis, since positive reactions were obtained in animals that were always free of mastitis. No definite cause is given for these positive reactions. The work of Hucker *et al.*, was confirmed, indicating that a negative brom-thymol-blue reaction does not assure freedom from mastitis.

3. The brom-thymol-blue reaction is of value as an aid in determining the relative disease or freedom from mastitis of a herd. If a large number of positive reactions are obtained it is a good indication that something is wrong in the herd but the individual cases cannot be detected.

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LETTER FROM GREAT BRITAIN

SOLVING THE SLUM PROBLEM

As ever, housing continues to occupy a great deal of the time and attention of all concerned or interested in health matters in this country. Further legislation in regard to it is in process of finding its way through Parliament into the statute book, and from time to time the Ministry of Health issues circulars and memoranda calling upon or urging local health authorities to take action.

The question of slum clearance, always serious, of late appears to have been taken more seriously. A call for the problem to be tackled vigorously has come from many quarters, many of them of a class in which the slum has been something more than merely a platform subject with which applause could readily be obtained, and the reputation of being a sociologist of some profundity and an authority on housing easily gained.

Since he took office, Sir E. Hilton Young, the Minister of Health, has earned the reputation of being of those not unwilling, in the political phrase, to explore all avenues to their end, to omit no stone from the process of turning and, in short, to take strong action as and when required. His most recent demonstration of this willingness has been in relation to the slum.

From his department there has come within the last few weeks a manifesto in the shape of a circular addressed to local government bodies as housing authorities, indicating the necessity for abandonment of the *festina lente* policy, and for actually making haste to solve the slum problem. Legal provisions, it is pointed out, are adequate for the purpose, and of this there is no doubt, most governments over a considerable period having taken a hand at legislating in regard to housing, and seeking to provide local authorities with encouragement, financial and moral, to clear away the property of the slum owner, compensating him on the lowest possible scale, and erecting new and more sanitary buildings on the site.

For years the expenditure on housing has been a terrible strain upon the finances of this country, the amount contributed to housing schemes out of State funds alone between 1919 and 1931 being in the neighborhood of £98,000,000. In spite of this, one of the inducements offered to local authorities to tackle the problem of slum clearance now is that the State contribution is at present on a particularly generous scale! In addition, it is pointed out that at the moment there are other favorable considerations, among them that money is cheap and labor costs low.

Conceivably these temptations may operate to induce the authorities to redouble their efforts to set about preparing a program under which at the end of 5 years the face of the land will no longer be disfigured by slums, and the erstwhile slum dwellers will be living happily and healthily in the new and sanitary accommodation provided for them.

GOOD HOUSES OR GOOD FOOD?

Unfortunately, so far as living happily and healthily is concerned, it appears that there is some possibility of doubt. That there might be a chance that there was a doubt that it might not be for the slum dweller transplanted to improved dwellings all that fancy painted has been suspected for some time by members of the health service and others.

At society meetings and elsewhere it has been mentioned that on new housing estates some of the people seemed not to be flourishing to the extent that had been expected, and that the children were less well nourished, perhaps, than they had been before they left the bad old homes.

To the Medical Officer of Health of Stockton-on-Tees—Dr. G. C. M. M'Gonigle—has fallen the task of showing that the suspicions entertained have been well founded, producing as evidence what has happened in an area and to a section of the population in his own town. Stockton-on-Tees, an important town in the county of Durham, is in normal times a busy manufacturing and shipbuilding center, but has suffered very badly as a result of the depression. Nevertheless, the local authority has endeavored to carry on the usual activities, particularly those concerning public health and housing.

In respect of housing quite considerable expenditure must have been incurred in clearing slums and providing alternative housing, and in 1927 particularly, one "unhealthy area" that was demolished led to the dishousing of some 710 persons. For the accommodation of these citizens a "self-contained municipal housing estate (Mount Pleasant)" was specially built in another part of the town. Watching this group closely, and the mortality and such other figures as were available regarding it, Dr. M'Gonigle found, during the 5 years succeeding its translation from bad to good housing conditions, sufficient evidence of deterioration in the state of health of the constituent members to warrant detailed investigation. This he carried out and, because he was fortunate enough to have a control population almost equal in size and living under conditions identical with those in which the transferred group existed before their removal, the results obtained have a peculiar value, and the conclusions reached may be regarded as worthy of very real respect.

Briefly, following the closest and most careful examination of all the facts and figures available, and investigation of all the conditions and all the factors that might conceivably be concerned, the conclusion reached was that from the health point of view the transferred group was in a less satisfactory state than the group resident in the bad old slum area; that there had been definite deterioration in the health of the transferred group; and that between the two the only outstanding difference was in regard to diet.

The folks in the slums were called upon to pay less for housing and had more to spend on food; those with the fine houses had to pay for the fineness, and to do so had to go short at mealtimes. In a word, they had to kill themselves in order to be able to live in dwellings guaranteed healthy, and the alternatives with which the slum dweller appears to be faced are of remaining in his slum, feeding fat, and taking a chance on its killing him; or moving into a high grade dwelling and living healthily until death from starvation supervenes.

Interesting and important as these observations and conclusions are, it is unlikely that they will affect the views of the government or lead the Minister of Health to order cancellation of the circular to which I have referred and of his instruction to the local housing authorities to prepare and submit to him within 6 months a program of the work in relation to slum clearance that they propose to complete in the ensuing 5 years.

VARIOUS CONFERENCES

Almost daily there arrive programs of conferences to be held during the summer months. Those most recently received include that of the National

Association for the Prevention of Tuberculosis for its nineteenth annual meeting at Cardiff on July 13, 14 and 15, and of the "Sixth English-Speaking Conference on Maternity and Child Welfare." This latter is to be held in London on July 5, 6 and 7.

The main discussion at Cardiff will be on "The Part Played in the Production of Tuberculosis respectively by (1) Infection and (2) Environmental Conditions," and will include references to special investigations carried out in special areas by the National Association, and the Welsh National Memorial Association—the body mainly concerned in dealing with tuberculosis in Wales, and as part of the proceedings there are to be addresses on its history and organization by persons intimately associated with it.

Among speakers announced to take part in the main discussion are Sir Robert Philip, the President of the Conference, to whom the National Association more or less owes its existence; Dr. Nathan Raw, a well known worker in the field of tuberculosis; Dr. W. G. Savage, Medical Officer of Health of Somerset County, Sedgwick Memorial Lecturer in 1932; Dr. Harley Williams, Medical Commissioner of the National Association; and others. Apart from the discussions, arrangements are in hand for visits and demonstrations appropriate to the work of the Conference and the association generally.

The program of the Maternity and Child Welfare Conference appears to be very full with sessions arranged by the various participating organizations on each of the three days. The President on this occasion is Sir George Newman, Chief Medical Officer, Ministry of Health, and he will deliver an address at the opening session. The subjects to be debated on the first day are "The Scope and Advancement of Ante-Natal Care," and "The Care and Protection of Illegitimate Children in Relation to Their Future Citizenship." The speakers include Miss Lilian Barker, Governor of the Borstal Institution, and Mr. Kirkpatrick of Dr. Barnardo's Homes.

On the evening of the second day, under the Chairmanship of Dr. Eric Pritchard, whose name is well known in connection with child welfare work, there will be a debate on "The Health of the Child in Relation to Its Environment, with Special Reference to Tuberculosis and Overcrowding." On the last day a series of subjects come under discussion, among them "Ways and Means of Propaganda," and "The Diet of the Child after the Period of Milk Feeding." As usual, there will be a child welfare exhibition and a number of social events—among others a garden party at St. James' Palace—and visits to places of importance from the educational point of view.

For the special benefit of medical members also it is noted that a short post-graduate clinical course has been arranged and will be held on July 3 and 4, the two days preceding the opening of the Conference. This and the Tuberculosis Conference usually attract a considerable number of delegates. That numbers may be smaller on this occasion, however, is not improbable on account of the decision of the Minister of Health to sanction the payment of the expenses of only one delegate, instead of those of two, as formerly, out of the funds of local authorities.

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INDUSTRIAL HYGIENE

Two Studies in the Psychological Effects of Noise—Study No. I, Psychological Experiments on the Effects of Noise, by K. G. Pollock and F. C. Bartlett, considers some preliminary experiments followed by a determination of the effects on simple motor skill and upon mental work. In regard to motor skill, persistent adverse initial effect showed no great magnitude; lack of synchronization tended to be disturbing; initial effects wore off rapidly; adaptation to noise took place rapidly. The initial effects on mental work as well as adaptation were similar to those on motor skill. Discontinuous, loud, mechanical noise was more disturbing than the continuous. A distinction appeared to exist between distraction and irritation. The latter does not necessarily mean less proficient performance. On the whole, all experiments showed that noise tends to produce slight, but readily recoverable, diminutions of efficiency. The effect may be different upon a social group than upon an individual. None of these effects related to auditory performance.

Part II, by H. C. Weston and S. Adams, considers the Effect of Noise on the Performance of Weavers. The results as a whole suggest that noise is detrimental to personal efficiency, though in the present case less than 1 per cent. However, the operations controlled entirely by the weaver occupied not over 5 minutes of the hour. The worker does not become completely adapted or acclimatized to noise even after years of work, but goes through the process of adaptation daily. With the reduction of noise, output becomes consistently more regular and less variable from hour to hour and day to day. While the available data are insufficient to justify any but tentative conclusions, they suggest that noise is not a negligible factor in industrial efficiency, in non-auditory tasks.—*Report No. 65*, 70 pages, 1932, Medical Research Council, H. M. Stationery Office (procurable from British Library of Information, 270 Madison Ave., New York). E. R. H.

School Health Education—The development of a program of health education in the public schools of the Bellevue-Yorkville District, New York, N. Y., is interestingly described in a well printed booklet of 58 pages. A consultant worked in close coöperation with school and health officials. Officers of the Board of Education and of the Department of Health, district superintendents, principals, teachers, school doctors and nurses, parents, children, staff members, all participated in the project.

After 4 years of experimental work, the summary notes, the teachers in these schools seem to appreciate the opportunities offered by the classroom day for the practice of healthful living and endeavor to help the children use these opportunities to advantage. The school showed an increase in the correction of dental defects averaging from 20 to 30 per cent. Gains in weight were noted, and these opportunities were used to interest the child in growth and to help him to understand what the factors were in his daily living which influenced growth.

A syllabus in health education was used in answering children's questions about the "how and why" of certain desirable behaviors, rather than as subject matter merely to be learned. Despite such obstacles as indifference or

ignorance of parents, poverty, inadequacy of school facilities, ill health on the part of a teacher, lack of sympathy or skill in some teachers, all of the schools are said to give evidence of improvement in individuals and groups in:

Use of the drinking fountains and other school equipment
Cleanliness of buildings and classrooms
Personal cleanliness, choice of lunches
Care of materials
Increased responsibility for ventilation, lighting, and temperature in classrooms
Drinking milk and eating vegetables
Care of younger children in school and at home
Interest in making one's self an efficient member of society

Nina B. Lamkin and Savel Zimand, Education for Healthful Living in the Public Schools of Bellevue-Yorkville, 1927–1931, 1932 (*55 cents* postpaid).

Treatment and Prevention of Heat Cramps—The article contains a number of case citations on the administration of common salt to men suffering from heat cramps as well as from prolonged exposure to high temperatures. The author concludes that salt administration has a markedly beneficial effect. Five grams or one teaspoonful to the gallon seems adequate and is not unpleasant to drink.—W. E. Eaton, *U. S. Nav. Med. Bull.*, 31, 2:162–164 (Apr.), 1933.

E. R. H.

Maternity Leave in Denmark—The Danish Women Workers' Union, composed of about 12,000 members, recently adopted a resolution to the effect that the Government and Parliament should be urged to guarantee women workers the payment of their wages in full during a rest period of 6 weeks before and 6 weeks after confinement. At present, women workers in Denmark are entitled to 4 weeks' rest after confinement, together with an allowance payable from public funds, on presentation of a medical certificate, requiring such a rest period.—*Indust. & Labour Inf.*, XLIV, 6:177 (Nov. 7), 1932. E. R. H.

An Enquiry in Poland—The Polish Ministry of Social Welfare recently appointed a special committee in each district in the country to examine labor conditions in the various occupations with reference to health and safety and to report within 6 months. The committees are composed of the head of the local health service, the factory inspector and the district doctors. When they have submitted their proposals, legislation relating to industrial hygiene and safety will be drafted. —Polish Ministry of Social Welfare, *Indust. & Labour Inf.*, XLVI, 5:123 (May 1), 1933. E. R. H.

State Silicosis Laboratory in Mexico—The Mexican Department of Labour has built a laboratory with microscopic and radiological apparatus for diagnosing silicosis and establishing the resulting incapacity for the purpose of evaluating compensation. The examinations are carried out by the Industrial Hygiene and Safety Section of the Department.—Mexican Department of Labour, *Indust. & Labour Inf.*, XLVI, 6:149 (May 8), 1933. E. R. H.

Annual Report, Bureau of Occupational Diseases, Ohio Department of Health, 1932—This typed report states that the Bureau was established December 31, 1932, to take over the functions of the former Division of Industrial Hygiene which was created in 1913 to make a state survey (reported in a special volume, 1915), and continued after 1915 with a personnel of chief, consultant, and stenographer-clerk. Its salary budget in 1931 was $6,500, reduced to approximately $3,250 in 1932, and to $2,050 for 1933.

Necessarily the personnel has been cut so that at present there is a part-time consultant and part-time stenographer-clerk.

The Bureau receives and evaluates all occupational diseases reported by the physician of the State, examines the records of lead works, determines additional employments from which minors should be prohibited, makes special investigations and performs considerable consulting work as well as the promoting of educational features, but the last two have been greatly curtailed.

During the course of the year, 1,169 reports of occupational diseases were passed upon, of which 1,069 were compensable, 90 were non-compensable, and 10 were acute mishaps, classified under accidents. The gross totals for the preceding four years were 1,189 (1928), 1,412 (1929), 1,334 (1930), and 1,309 (1931). Of these, the non-compensable occupational diseases reported were, respectively, 48, 68, 59, and 77 (acute mishaps not included).

The schedule of compensable diseases in Ohio numbers 22 items, of which "dermatitis" gathers in 70 to 80 per cent of the total cases reported, with lead poisoning next in order (about 15 per cent), tenosynovitis of the wrist tendons also about 15 per cent), and the balance scattered. During the 5-year period, 1928–1932, there were no cases of the following reported: anthrax, glanders, mercury poisoning, phosphorus poisoning, carbon dioxide poisoning, manganese dioxide poisoning, and radium poisoning. None of the following exceeded 11 cases per annum during this period: benzol poisoning (and certain of its derivatives), volatile petroleum products, carbon bisulphide poisoning except 18 cases in an outbreak in 1931, wood alcohol poisoning, epithelioma, brass or zinc poisoning, potassium cyanide poisoning, and sulphur dioxide poisoning. Chrome ulceratons (nasal and skin) ran, for the 5 years: 6, 10, 20, 16, and 79, respectively. Prepatellar bursitis (first reported in 1929) ran 13, 23, 29, and 23, respectively. Compressed air illness ran 16, 62, 59, 5, and 20, respectively.

In the non-compensable group, lung dust afflictions totaled 81 for the 5-year period (anthracosis 1, pneumoconiosis 80); by the year, these were 13, 15, 12, 19, and 22, respectively. Carbon monoxide poisoning, as the result of repeated exposures, ran 2, 2, 2, 4, and 1, respectively; lacquer poisoning (n.o.s.), 3, 3, 1, 2, and 1, respectively. Among afflictions whose causative agent was not clear or definite, bronchitis and asthma registered 11, 14, 12, 10, and 4; neuritis 4, 5, 3, 2, and 3; and tuberculosis 6, 8, 9, 9, and 18.

The majority of the acute mishaps were carbon monoxide poisonings, not including domestic occurrences of the same poisoning.

During the year the consultant was engaged with 121 conferences and 321 correspondence-consultations upon occupational diseases. Some 20 field investigations were made and 16 special inquiries. To render the individual occupational disease reports fairly complete necessitated 817 follow-up form-letters and about 50 special letters of inquiry. A total of 12 days was spent in court and special hearings. The Bureau also prepared an exhibit on occupational diseases and hazards, chiefly silicosis, for the Washington meeting (October 24–27, 1932) of the American Public Health Association.

E. R. H.

Compensation for Occupational Diseases in French West Africa—An order issued by the Governor General of French West Africa on January 22, 1933, provides for the operation in that territory of a French Decree of December 12, 1932, which gave effect to the terms of the Convention concerning workmen's compensation for occu-

pational diseases, adopted by the International Labour Conference at its Seventh Session (1925).—West Africa, *Indust. & Labour Inf.*, XLVI, 4:87 (April 24), 1933. E. R. H.

Safety in the Manufacture and Use of Celluloid—Continuing its series of monographs on industrial safety, the International Labour Office has just published, under the above title, a report on safety in connection with the handling of celluloid.

The monograph was drafted by Mr. Stiller of the German Ministry of Labour.

The report begins with a general survey dealing with the distribution and economic importance of celluloid, the nature and uses of the material, the dangers involved for the workers employed and the neighborhood of undertakings, and the substitutes available. This is followed by a description of technical safety measures, for the protection both of the workers and of the neighborhood, in the manufacture of nitrocellulose, celluloid, celluloid goods, film and film bases, the preparation of cinematographic films, celluloid depots, homework, packing and transport.

The second part of the monograph gives the safety regulations in force in various countries, including Denmark, France, Germany, Great Britain, Italy, Japan, and Sweden.—International Labour Office, *Indust. & Labour Inf.*, XLVI, 6:139–40 (May 8), 1933. E. R. H.

Medical Certificates and Industrial Diseases—Ever since the Act of 1906 has been in force, the workman suffering from an industrial disease has had to obtain a certificate from the certifying factory surgeon, unless the employer dispenses with it. This system is designed to prevent disputes between employer and the workman by providing for certification by an independent doctor with special knowledge of industrial disease, a feature which would not be achieved if certifications by the workman's own medical adviser were substituted. For this, the workman pays a fee of five shillings, but the whole of the compensation is paid by the employer, whereas under the Health Insurance Act weekly contributions are paid by the workers. Home Secretary, Great Britain, *Lancet*, 5720:835 (April 15), 1933. E. R. H.

The Occupational Progress of Women, 1910–1930—This detailed bulletin should be consulted further by those interested. In brief, during this period, a large increase has taken place among women usually at work and especially women in non-agricultural pursuits. At the same time, a great reduction in child labor has become evident. There has also been a decided change in the distribution of women among the various gainful pursuits. The effects of the industrial depression will be watched with interest.—Mary V. Dempsey, U. S. Women's Bureau, *Bull. No. 104*, 1933, 87 pp. E. R. H.

Workmen's Compensation in Pulmonary Disease—A description of the various British Acts and Schemes covering compensation for industrial pulmonary diseases, especially silicosis and asbestosis.—Charles L. Sutherland, *J. State Med.*, 40, 12:709–16 (Dec.), 1932. E. R. H.

Health Hazards from Specific Poisons in Industry—Classifying the hazards under five headings—communicable diseases, atmospheric conditions, contact with materials, accidents, and absorption of specific poisons—the author comments upon the company's attitude and that of the workmen in respect to the inspection of the plant and the determination

whether poisonous materials are used. Most of the spectacular and serious occupational cases occur in plants where the workmen and executives alike are ignorant of the poisonous nature of the materials used.

In connection with silica and lead dusts, the author considers that ultramicroscopic size renders control difficult if not impossible in some cases, but points out that a common way to ascertain the presence of invisible dust in a process is to take dust accumulations from rafters, sills, etc. Expensive exhaust systems are of relatively little value if fine dust is permitted to remain on places of lodgment since vibrations and movements of materials continually stir it up. "After some spectacular case of poisoning has occurred, many people would unthinkingly advocate the prohibition of the specific, or all poisonous materials, in industry. This stand, however, seems unreasonable."—F. M. R. Bulmer, *Canad. P. H. J.*, 24, 4:155–61 (April), 1933. E. R. H.

Dust Elimination in the Pottery Industry—There are two generally recognized health hazards in the manufacture of pottery—lead and silica dusts. An experimental study of dust conditions was made in a plant to serve as a guide to remedial measures.

Dust particle count was determined, using the Greenburg impinger, likewise dust weight determinations. These were made in the jigger shop (clay shop), separate finishing room, stove rooms, and kiln placing rooms.

The average dust count in the clay shop was about 150 particles per c.c., or less than half the strictest requirement of the Public Health Service, and the measures instituted again cut this figure in two. In the finishing room, dust counts of 228 particles and 5.9 mg. per cu. ft., without suction, were reduced to 129 and 1.2 respectively by the use of a new finishing bench with suction. In the kiln placing room the company in question has used kaolin instead of quartz for placing or "bedding" purposes, thus avoiding the flint dust hazard here. (Other interesting dust counts and weights are tabulated.)—Edward Schramm, *J. Am. Ceramic Soc.*, 16, 5:205–13 (May), 1933. E. R. H.

Review of Literature Dealing with Health Hazards in Spray Painting—This special Bulletin No. 15, 44 pages, published in 1930, should be consulted by all interested in this subject and is obtainable from the National Research Council of Canada, Ottawa, price 25 cents. It also contains a valuable bibliography of 148 references. E. R. H.

VITAL STATISTICS

Increase in Heart Disease—Provisional mortality figures for 1932 show that deaths from heart disease in Wisconsin gave a death rate of 218.5 per 100,000 of population, in comparison with a rate of 202.9 for 1931. The rate is said to be the highest ever recorded by the State Health Department. A marked increase in influenza also occurred, 28.6 for 1932 in comparison with 18.7 for 1931. Tuberculosis, on the other hand, showed a decline from 48.7 in 1931 to 45.1 for 1932. The infant mortality rate was estimated provisionally at about 46 per 1,000 live births, as compared with 52.9 in 1931. The death rate from diarrhea and enteritis under 2 years of age was 6.9, the lowest ever reported. Incomplete reports of deaths amounted to 30,046 and of births, about 53,000.—*J. A. M. A.* 100:1350 (Apr. 29), 1933.

Low Records for Contagious Diseases—A survey of five contagious diseases in Rhode Island during the period 1928–1932 revealed that death rates for typhoid fever, diphtheria and scarlet fever were the lowest in the history of the state. The mortality rates for measles and whooping cough also declined in the 5-year period, although both diseases reached record breaking peaks of morbidity in 1932. The survey showed an average of 47 cases with 6 deaths a year for typhoid. Diphtheria declined from 641 cases in 1928 to 260 in 1932, an improvement held to be the result of state-wide immunization. Scarlet fever averaged 1,431 cases, with 14 deaths a year. For measles the average was 4,925 cases a year, with 34 deaths, and for whooping cough it was 592 cases, with 33 deaths. In 1932 there were 11,330 cases of measles and 975 of whooping cough.—*J. A. M. A.* 100:1349 (Apr. 29), 1933.

Diphtheria Mortality in Alabama—Figures just released by the U. S. Public Health Service reveal that the death rate from diphtheria in Alabama for the last year (1932) was the third highest of the 28 states for which provisional figures are available. The diphtheria death rate per 100,000 population in Alabama was 7.5, as compared with 3.8 for all 28 states. West Virginia and Tennessee were the 2 states having higher rates than Alabama, namely, 13.2 and 8.2 per 100,000 population, respectively. The lowest rate was in Montana and Minnesota, the rate being only 0.9 per 100,000 in each of these states.

During the past 3 years, the death rate from diphtheria for the white population of Alabama has increased steadily. In 1930 the rate was 8.7, in 1931 it was 9.0 and in 1932, it was 10.4. For the colored population the rates were 4.2, 5.2, and 2.5 for the 3 years 1930, 1931 and 1932 respectively. The increase, observed for the white population, is counterbalanced to some extent by the decrease for the colored population, so that the 1932 rate for the total population is no higher than the rate in 1931. In 1930 the rate for the total population was only 7.1.

For the 3 years, 1930–1932 the number of immunizations against diphtheria, done almost exclusively in counties with organized health departments, has doubled. There were 142,274 immunizations for this period against 74,543 during the preceding 3-year period. In the last year, the potent one-dose toxoid preparation for diphtheria has eliminated one of the practi-

cal difficulties of mass immunization, since equal or better protection is afforded by this preparation, using only one injection, than was obtained formerly by using three injections.

It must be remembered, however, that to affect the mortality from diphtheria, immunizations must be largely accomplished during the preschool period. Seventy-four per cent of the deaths from diphtheria in Alabama for the years 1930–1932 were among children under 5 years of age. It has been shown that to lower significantly the death rate from diphtheria, 30 per cent of the population of this age group must be immunized. The Census of 1930 gave Alabama 313,882 children between 1 and 5 years of age. Immunization in Alabama so far has reached only a small percentage of this group.

Analysis of diphtheria mortality figures for the counties of Alabama shows wide fluctuations. Three counties show recorded death rates in excess of 30 per 100,000; 4 show rates between 20 and 30; and 9 show rates between 10 and 20. On the other side of the picture, 11 show rates between 3 and 4 per 100,000, 4 between 2 and 3, and 12 counties show no deaths at all from diphtheria in 1932. Obviously, diphtheria presents a serious public health problem in the counties where the mortality is high.—Alabama State Dept. of Health. *Month. Stat. Bull.* (May), 1933, p. 3–4.

Mortality in Certain States During 1932, with Comparative Data for Recent Years—For several years the U. S. Public Health Service has secured, from state health departments, current mortality data and has published death rates from important causes from as many states as could furnish the information. The summary of these preliminary rates serves as a current index of mortality until final figures are available, and for purposes of comparison, figures derived from the same sources in previous years are used. For the year 1932, nearly all the death rates are based on data from 28 states with an aggregate population of nearly 94 million. While the rates in this group of states may not be the same as those for the total registration area, it is highly probable that the trend in these rates will be comparable with the trend in the rates in the total registration area. In considering the trend of the rates during the last 5 years, it should be remembered that the mortality in 1928 and 1929 was increased somewhat by the influenza epidemic of the winter of 1928–1929, that 1930 was free from any wide-spread epidemic, and that such epidemics as occurred in 1931 and 1932 were distinctly minor.

The death rate from all causes in 27 states reporting was 10.8 in 1932, as compared with 11.0 and 11.2 in 1931 and 1930, respectively. Of the 27 states, 20 showed a decline in 1932 from 1931, and 3 an increase in mortality, with 4 states having the same rates in both years.

In 26 states the infant mortality in 1932 was 58 per 1,000 live births as compared with 61 and 62 for 1931 and 1930, respectively. Considering the individual states, 22 of the 26 states with data available for both years showed a decrease in 1932 as compared with 1931, with increases in the other 4 states.

In spite of the fact that 1932 represents the third year of the depression, the death rate from tuberculosis in the group of 28 states was only 60 per 100,000 as compared to 65 and 68 in 1931 and 1930, respectively. Of the 28 states, 26 showed a decline and only 2 an increase; however, in 4 states the decline was very small.

Typhoid fever continued to decline rather steadily, showing a death rate of 3.2 per 100,000 for 1932 as compared with 3.8 and 4.0 for 1931 and

1930, respectively. Only 5 states had higher typhoid rates in 1932 than in 1931. Diarrhea and enteritis likewise continued a steady decline. The deaths from this cause, of children under 2 years of age, amounted to 10.3 per 100,000 total population as compared with 14.0 and 17.9 in 1931 and 1930, respectively. Of the 27 states with available data, 26 showed decreases and only 1 showed an increase in 1932 over 1931.

Influenza, of apparently a mild form, was rather prevalent in the early spring months of 1932 and again in December, with the major portion of the mild epidemic coming in the last week of 1932 and the first week of 1933. A minor epidemic also occurred in 1931, but 1930 was free from any excess deaths from this cause. The deaths credited to influenza in 1932 amounted to 28 per 100,000 as compared with 26 and 19 in 1931 and 1930, respectively. All of these rates are distinctly lower than those for 1928 and 1929, when a more severe epidemic occurred. Mortality from pneumonia was slightly less in 1932 than in preceding years, being 77 in 1932 as compared with 82 and 83 in 1931 and 1930, respectively. For influenza and pneumonia, combined, the mortality of 105 per 100,000 recorded for 1932 was slightly lower than in 1931 (107) and slightly higher than in 1930 (102). The mortality of 1928 and 1929 was definitely higher for both causes. Of the 28 states, 20 had higher influenza rates in 1932 than in 1931, while only 8 had higher pneumonia rates in 1932.

Because of wave-like fluctuations that occur in the incidence of the communicable diseases of children, the comparison of one year with another means little as far as the real trend of the mortality from these diseases is concerned. Diphtheria, which has been declining for many years, reached a new low level of 3.8 in these 28 states as compared with 4.0 and 4.6 in 1931 and 1930, respectively. The mortality from this much dreaded disease was lower in 1932 than the mortality from whooping cough.

The death rate from poliomyelitis (0.7) in 1932 was the same as the rate in 1929, and considerably less than in either 1931, when it was 1.9, or in 1930 when it was 1.1. In 1930 the disease was epidemic in certain states, and 1931 marked a considerable epidemic in the eastern states and particularly in New York City. Meningitis mortality was likewise low in 1932, showing only 1.3 deaths per 100,000 population.

The death rate from diabetes was greater in 1932 than in any of the previous 4 years. In 1932 the mortality rate was 21.7 as compared with 20.3 in 1931, 19.1 in 1930, 18.8 in 1929 and 19.4 in 1928. In 21 of the 28 states there was an increase in 1932 as compared with 1931; in 6 states there was a decrease; and in 1 state the same rate prevailed in both years. Cancer continued its steady increase, the rate being 101 per 100,000 in 1932 as against 97.6 in 1931, 96.5 in 1930, 95.5 in 1929 and 95.8 in 1928. In 20 of the 28 states it increased in 1932 as compared with 1931 and in 8 it decreased.

Diseases of the heart also continued to increase, the death rate for 26 states in 1932 being 219.5, as compared with 211.7 in 1931, 209.6 in 1930, 215 in 1929 and 214.6 in 1928, 20 of the 26 states with available data having higher rates in 1932 than in 1931. The death rate from nephritis was about the same in 1932 (84.4) as in 1931 (83.7) but was less than in 1930 (88.0) in the group of 27 states with available data. In 25 states with available data on cerebral hemorrhage, the rate in 1932 was very slightly above that for the last 2 preceding years. In 13 of these states there was an increase in 1932 over 1931, in 11 a decrease, and in 1

the rate was the same for both years.—*Pub. Health Rep.* 48:478–480 (May 5), 1933.

Smallpox in the United States and Canada, 1932—There has been a marked and gratifying decline in the amount of smallpox during the last 3 years. In 1930, the number of cases reported in 44 states, the District of Columbia, and 8 Canadian Provinces totaled 46,654; in 1931, they numbered 29,493; and in 1932, only 13,121. In other words, the incidence of this disease decreased about 37 per cent in 1931, and 56 per cent in 1932; since 1930, there has been a total decline of 72 per cent. No single incident would give American and Canadian public health workers greater satisfaction than to accomplish the final eradication of this unnecessary and preventable disease.

It is significant that over 90 per cent of the 12,784 cases reported in the United States in 1932 occurred in less than half of the 44 states. South Dakota, alone, reported almost 1,800 cases, equivalent to the extremely high case rate of 255 per 100,000 population. If this rate had prevailed throughout the country, there would have occurred 318,000 cases of smallpox in the United States during 1932.

The case of Vermont is unique. In this state, the fourth smallest in the Union in respect to population, there have been reported, during the last 4 years, over 900 cases of smallpox. This is particularly significant in view of the fact that Vermont is surrounded by territory which has been singularly free from this disease for at least a decade. This territory, comprised of the rest of New England, New York, and the Province of Quebec, with nearly 24 million inhabitants, reported only 345 cases of smallpox during 1932. Vermont, on the other hand, with a population of only 361,000, reported 254 cases. In other words, in Vermont there were 70 cases of smallpox for every 100,000 inhabitants; in the neighboring territory there was only 1 case for every 100,000 persons exposed to the disease. It is significant that Vermont has no compulsory vaccination law on its statute books. It is in this and other states where the routine vaccination of children is neglected that smallpox still lingers to plague public health workers.

The disease as reported throughout the United States and Canada was generally of the mild discrete type, with an average case-fatality rate of about 3 per 1,000 cases. An outstanding exception was recorded in Vancouver, B. C. Here, and in the nearby vicinity, during the early months of 1932, there occurred 56 cases of smallpox, 29 of which were definitely identified as of the confluent, virulent type. Before the outburst was brought under control, 16 persons, after prolonged physical suffering, succumbed to the disease. Only one additional death from smallpox was registered in 8 Canadian provinces last year. Of the total of 56 cases in Vancouver, 39, or 70 per cent, had never been successfully vaccinated prior to infection. The remaining 17 had been vaccinated from 15 to 55 years previously, their immunity having diminished almost to the vanishing point during this long period. No one contracted the disease who had been vaccinated within 15 years. The outbreak was finally brought under complete control through the wholesale vaccination of the population.

This epidemic is most illuminating, for it shows what may happen to a community in which antivaccination propaganda has been rife. One can readily picture conditions in South Dakota, for example, if the same case-fatality rate had prevailed there as was recorded in Vancouver (286 deaths per 1,000 cases). In that event, there would have occurred in the state of South

Dakota, 514 deaths from smallpox during 1932, almost as many deaths as are caused there each year by cancer, and equaling the combined annual death rate from tuberculosis, appendicitis, and puerperal causes.—*Stat. Bull.* Met. Life Ins. Co. 14:6–7 (May), 1933.

PUBLIC HEALTH ENGINEERING

The Corrosion of Metals by Milk—In tests carried out in one of the pasteurizing plants of New York City samples of milk were taken from 13 different locations of the pasteurizing equipment and analyzed for copper content. In one of the cases strips of various metals were exposed in raw milk for different lengths of time and at controlled temperatures.

It was demonstrated rather conclusively that copper, nickel, and copper and nickel alloys when exposed to milk during pasteurization may cause an increase above 0.7 p.p.m. or a decrease below 0.3 p.p.m. in the copper content of the milk. This change was more pronounced at the higher temperatures. When milk in contact with nickel loses copper this material is precipitated out and nickel goes into solution. Nickel corroded in milk more readily in the absence of oxygen, while copper corroded more readily in its presence. High chromium nickel iron alloys, "Hyblum" (a high-aluminum nickel-aluminum alloy), chromium-plated copper, and chromium-plated nickel were very resistant to corrosion by milk and for this reason appeared to be satisfactory for dairy equipment. C. G. Fink and F. A. Rohrman, *J. Dairy Sci.*, XV, 9, 73–86 (1932). *Exper. Sta. Record*, U. S. Dept. of Agri. LXVII, 6, 735 (Dec.), 1932. From *Pub. Health Eng. Abstr.*

Jute Causes Trouble—Kalamazoo, Mich., recently completed a new 7,000,000 gal. distribution reservoir and 7,000 ft. of 24" pipe line to connect the old system with the reservoir. Dresser couplings were used on the pipe line, except for the joints to fittings and valves, which were caulked with jute and lead or leadite. Before attempting sterilization all surface dirt was brushed from the inside of the pipe line and reservoir. Then by using a Wallace and Tiernan portable chlorinator the main was chlorinated with a dosage of 40 p.p.m. for 8 hours. The reservoir was then thoroughly sprayed with a solution containing 40 p.p.m. chlorine. Tests for bacteriological examination indicated colon organisms in 0.1 ml. quantities. Sterilization of main and reservoir using a much higher dosage was attempted a second time but bacteriological results were again positive.

An analysis of the jute used in the joints showed positive reactions in samples of 0.05 gm. of the unbraided jute. Three types of aerobic lactose fermenters were recovered from the unbraided jute samples and from the water samples. From the observations the following conclusions seem justified: (1) new installation of water mains and reservoir presented unusual difficulties in sterilization; (2) jute was a major source of contamination of the mains; (3) sterilization of mains contaminated by jute packing is very difficult; (4) bacteriological control is necessary in the proper sterilization of water mains and water equipment. Geo. I. White, W. W. Eng., LXXXV, 24, 1420–21 (Nov. 30), 1932. From *Pub. Health Eng. Abstr.*

Air Conditioning for Small Buildings—In order to supply air conditioning units for small buildings, such as residences, small offices, etc., and still keep the cost of the equipment at a minimum, it has been necessary at the present time to stress cheaper methods of production, distribution and installation of such equipment. At present some attempts are being made to develop cheaper methods of air conditioning but these methods have as yet not been fully developed. The problem of cheaper production methods has been solved by the development of designs which can be produced en masse in units capable of being shipped practically in full assembly. This plan also helps to keep the installation costs at a minimum. As a result of the ability to manufacture standard air conditioning units for small buildings there has been a steady increase in the number of installations of such equipment in the past 12 months. A summary of the various standard units of each type of air conditioning equipment is presented elsewhere in this issue of the Journal along with the principal characteristics of each unit. Some operating data are also included. Anon., Heat. & Vent., XXIX, 29, 10, 23–24 (Oct.), 1932. From *Pub. Health Eng. Abstr.*

Chlorinating an Open Bathing Beach—Lake Lynn, W. Va., is an artificial fresh-water lake formed by a hydro-electric power dam. A section containing about 4½ mil. gal. of water is used as a bathing place by 1,000 to 6,000 persons daily in hot weather. Draw-down of the lake about 4 ft. once a week by the power plant and refilling from the Cheat River gives a complete change of water at the beach every 2–3 weeks. In 1930, 9 out of 16, and in 1931, 5 out of 18 ten c.c. samples showed *B. coli*. About 40 gal. of a solution of HTH powder, containing about 10,000 p.p.m. of available chlorine, was then sprayed on the surface of the water every morning. Gas-forming organisms were not entirely eliminated, but *B. coli* were absent in all samples. Larger chlorine dosage and chlorination of streams entering the lake at the beach are planned. L. M. Board, *Munic. San.*, III, 194, 1932. From *Summary of Current Lit.*, Water Poll. Res., VI, 5, 156 (May), 1933.

Comparison of Results with Standard Lactose, Brilliant Green Bile, and Dominick-Lauter Broths—The results of experiments on the isolation of *B. coli* in raw, filtered, and chlorinated water using standard lactose broth, brilliant green bile broth (2 per cent bile and 1:75,000 brilliant green) and Dominick-Lauter broth are tabulated and compared. All tubes were incubated for 48 hrs. and positive fermenters examined at the end of 24 and 48 hrs. The presumptive tubes were examined according to standard methods, and also all positive lactose broth and Dominick-Lauter broth tubes were planted direct into brilliant green bile broth, and positive brilliant green bile broth tubes into lactose broth. The total percentage confirmed in lactose broth and brilliant green bile was 28.6 and in Dominick-Lauter 28.3. Of the presumptive lactose broth and Dominick-Lauter tubes planted direct into brilliant green bile broth 86.6 and 99.2 per cent confirmed as against 79.3 and 98.3 per cent, according to standard methods, while of the brilliant green bile presumptives planted direct into lactose broth 97.2 per cent were confirmed, as against 93.7 by standard methods. In raw water brilliant green bile gave 1.4 per cent and Dominick-Lauter broth 0.7 per cent more confirmed results (standard methods) than lactose broth. In filtered water, however, lactose broth gave 37 per cent confirmed while brilliant green bile and Dominick-Lauter each gave 34.6. In

chlorinated water, three 24-hour and twenty-six 48-hour tubes fermented, of which only one or 3.4 per cent confirmed with lactose broth; brilliant green bile and Dominick-Lauter broth each produced one presumptive in 24 hrs. and one in 48 hrs., of which one or 50 per cent confirmed in each medium. The direct planting method takes less time and gives greater recovery of *B. coli* than confirmation by standard methods. The Dominick-Lauter medium showed a very high recovery, occasionally reaching 100 per cent, but is more difficult to prepare than lactose broth or brilliant green bile, and the examination takes longer. N. J. Howard, *J. Am. W. W. Assn.*, 24, 1305, 1932. From *Summary of Current Lit.*, Water Poll. Res., VI, 5, 161 (May), 1933.

Industrial Wastes Which May or May Not Enter Sewers—In discussing the admission of industrial wastes into sewers, the author divides the wastes into 4 classes: (1) those admissible to sewers without previous treatment; (2) those admissible after flow adjustment; (3) those admissible after preliminary treatment; and (4) those to be excluded. Examples are given of types of wastes belonging to each of these classes and arrangements possible between sewage works and industries are discussed. H. M. Freeburn, *Munic. San.*, 3, 284, 1932. From *Summary of Current Lit.*, Water Poll. Res., VI, 5 (May), 1933.

Operating Costs of Sewage Treatment in North Carolina—Gastonia, N. C., which treats more than 1 mil. gal. per day of sewage in an activated sludge plant, using 2.03 cu. ft. of air per gal. of sewage and 7.5 lb. ferric chloride per 1,000 gal. of sludge, and Oliver vacuum filters for sludge dewatering, operates at a cost of $54.33 per mil. gal. of sewage. High Point, N. C., has a similar plant the operating costs of which are $42.78 per mil. gal. Two activated sludge plants, located at Charlotte, N. C., which treat over 6 mil. gal. per day, including wastes from dyeing and textile plants, cost $23 per mil. gal. to operate. Oliver filters are used in one plant for sludge dewatering and the other has separate sludge digestion. *Pub. Works*, 63, 49, 1932; *Sewage Works J.*, 4, 585, 1932. From *Summary of Current Lit.*, Water Poll. Res., VI, 5 (May), 1933.

Interceptor and Sewage Disposal Works at Fort William, Ont.—An illustrated account of the new sewers and sewage treatment plant installed at Fort William, Ontario, to eliminate the pollution of Neebing River by raw sewage. An intercepting sewer was constructed carrying 3 times the dry weather flow to a disposal plant providing for sedimentation in tanks with double spiral scrapers, sludge digestion, sludge storage during winter and drying on open beds. The plant effluent will be discharged into the lower reaches of the river, the digestion tanks heated to 80° F., the digesting sludge maintained at pH 7.2–7.5, the sludge gas collected and burned and the dried sludge used as fill and fertilizer. R. O. W. Roberts, *Canad. Eng.*, LXIII, 24, 17, 1932. From *Summary of Current Lit.*, Water Poll. Res., VI, 5, (May), 1933.

FOOD AND NUTRITION

Effects of Freezing on the Spores and Toxin of Clostridium Botulinum—The production and marketing of frozen vegetables and fruits without heat sterilization has raised the question as to whether or not there is a possibility of botulinus poisoning arising from the consumption of such products which had been improperly handled. A series of experiments were conducted to study the effect of "quick" and "slow" freezing upon the viability of *Cl. botulinum* spores and the potency of botulinus toxin. Freezing the spores with solid carbon dioxide ice was resorted to for "quick" freezing while exposure in a cold room at a temperature between 18° and 20° F. was used for the "slow" freezing process. In studying the effect of freezing upon *Cl. botulinum* spores the conditions of experimentation resembled those existing in commercial practice. Dried *Cl. botulinum* spores (Type B) suspended and heated in a Sörenson buffer solution of pH 6.9 and in pea juice pH 7.1 were frozen with solid carbon dioxide ice, defrosted at intervals, and the total number of viable spores as well as the presence of toxin determined. There was no reduction in the number of viable spores, neither when defrosted and examined immediately after being frozen nor when they had been frozen for 9 days and then examined. Subcutaneous injections into guinea pigs of portions of centrifugated suspensions after freezing show that no toxin had been liberated by the spores by freezing. A suspension of dried spores of the same botulinus culture was divided among several test tubes and frozen by exposure in a refrigerated room at approximately 20° F. Twenty-four to 36 hours were required for the suspensions to be thoroughly solidified. Examination of portions one day after being frozen and periodically to 11 weeks showed that there was neither a reduction in the total numbers of living spores, nor was toxin liberated. Botulinus toxin frozen and defrosted 15 times was not reduced in strength.—Lawrence H. James, *J. Infect. Dis.*, 52:236 (Mar.-Apr.), 1933.

The Germicidal Efficiency of Sodium Hydroxide—This work was prompted by the need for an efficient, odorless, and relatively non-poisonous disinfectant sufficiently cheap to warrant its routine use in milk houses, dairy barns, swine barns, and other farm buildings. Preliminary studies on sodium hydroxide indicated a satisfactory germicidal efficiency against non-sporulating organisms. The author has given a comprehensive review of the literature and presents details of his experimental work upon the germicidal efficiency, the effect of the presence of organic matter on germicidal efficiency, the effect of temperature variation, and the factors responsible for destruction of microörganisms by sodium hydroxide. High test commercial lye was found a satisfactory source of sodium hydroxide in addition to being cheap and readily available. The Reddish technic for testing germicidal efficiency was used throughout the experiment, the test organisms being *Brucella abortus* of both bovine and porcine origin and *Escherichia coli*. Tests were also made under field conditions for which a definite technic was worked out. The author concludes that sodium hydroxide in the form of high-test commercial lye appears to satisfy the need for a disinfectant suitable for use in barns and

stables and that it is inexpensive, odorless, and very efficient against *Brucella abortus* and related microörganisms. The velocity of disinfection with sodium hydroxide between 25° C. and 2° C. is independent of temperature changes. This phenomenon appears to be correlated with the peculiar physicochemical reaction of sodium hydroxide solutions to temperature changes, wherein the ratio of hydroxyl-ion activity to the hydrogen-ion activity increases with a decrease in temperature.

At a given temperature, a given hydroxyl-ion concentration possesses a germicidal activity which is independent of the amount of alkali used to attain the hydroxyl-ion concentration. The author concludes, therefore, that the activity of the hydroxyl-ions is the most important factor in the destruction of microörganisms by sodium hydroxide.—Ernest C. McCulloch, *J. Bact.*, 25:469 (May), 1933.

The Action of Hexylresorcinol on Bacteria in Certain Food Products—The authors have studied the action of hexylresorcinol on bacteria in certain food products with the view that it might be used as an efficient food preservative. The work of previous investigators had shown it to be harmless to man and to possess a high phenol coefficient, properties desirable in a food preservative.

Milk, ground meat, tomatoes, and eggs were chosen as representative foods to be tested with hexylresorcinol. Equal weights of raw test foods were placed in sterile flasks and varying amounts of hexylresorçinol of known concentration added. Six concentrations of hexylresorcinol ranging from 1:100 to 1:10,000, together with control flasks without the added preservative, were employed with each food. The preservative action was checked in each product by making bacterial counts of the controls and of the samples containing preservative at stated intervals. The results obtained indicate that hexylresorcinol has little preservative action in the protein foods, that is, milk, ground meat, and eggs, only the highest concentration (1:100 dilution) exhibiting any appreciable effect. However, in the acid food tested, tomatoes, hexylresorcinol in dilutions as high as 1:5,000 causes a marked reduction in the bacterial content.—Charles F. Poe and Hazel A. Fehlmann, *J. Bact.*, 25:521 (May), 1933.

Microbiology of Frozen Foods. *IV. Longevity of Certain Pathogenic Bacteria in Frozen Cherries and in Frozen Cherry Juice*—Recognizing that the use of a sewage-polluted water supply or the employment of a typhoid carrier might result in dangerous contamination of foods to be preserved by freezing, experiments were conducted to ascertain the longevity of *Eberthella typhi, Salmonella schottmülleri, Salmonella aertrycke, Bacterium coli* and *Proteus vulgaris* in frozen red sour cherries and frozen cherry juice. Cherries inoculated with the test organisms were packed under 26 in. of vacuum and stored at 0° F. and —40° F. Bacteriological examinations made at regular intervals showed that at 0° F. *B. coli* and *S. aertrycke* survived 12 weeks, *Proteus vulgaris* 14 weeks, *S. schottmülleri* 16 weeks and *E. typhi* 18 weeks. At—40° F. *S. schottmülleri* survived 8 weeks, whereas the remaining four organisms used remained viable for 10 weeks. Sterile cherry juice in ampoules was inoculated with the organism named stored in frozen condition. Several such experiments were conducted. The results of one experiment reported show that *E. typhi* could not be recovered from the frozen juice in the second week, *Proteus vulgaris, S. aertrycke,* and *S. schottmülleri* were not viable the third week of storage, and *B. coli* was

not present in viable form the fourth week. The results of these experiments indicate that bacteria of the colon-typhoid group might be expected to survive in frozen cherries after two months.—G. I. Wallace and S. E. Park, *J. Infect. Dis.*, 52:146 (Mar.-Apr.), 1933.

Microbiology of Frozen Foods. *V. The Behavior of Clostridium Botulinum in Frozen Fruits and in Vegetables*—In view of the fact that no steps are taken to destroy *Cl. botulinum* in the commercial methods of preparation of frozen foods and the possibility of careless handling by consumers unfamiliar with these products, an investigation was undertaken to determine whether or not botulism could occur through the agency of frozen foods. Experiments were conducted to determine the effect of freezing on botulinus toxin as well as on atoxic spores of *Cl. botulinum* in various foods. The foods used were cherries, strawberries, black raspberries, peas, green beans, and carrots. A series of 24 glass containers were packed with each food and subdivisions inoculated with mass cultures of toxic and heat detoxified strains of *Cl. botulinum* types A and B. The containers were stored at —16° C. Samples were examined at intervals of two weeks, two, three, six, nine, and twelve months. Samples were thawed at room temperature. The samples inoculated with toxic cultures were fed only once after thawing. The samples inoculated with atoxic cultures were fed to guinea pigs immediately after thawing, and three, six, and ten days after thawing. It was demonstrated that the toxin and spores of *Cl. botulinum* types A and B were not destroyed after being frozen and held one year at —16° C. Although in many instances toxin production was not demonstrated after thawing at room temperature, anaerobic bacterial growth was observed in practically all containers held at room temperature. In 4 per cent of the samples fed to guinea pigs after thawing, toxic symptoms did not develop before the fifth day after feeding and usually not until the third week after feeding. It was further observed that potent toxin was present in 4 out of 72 feedings of material taken immediately after thawing from samples originally inoculated with atoxic cultures. In 2 and possibly 3 cases toxin production occurred in such acid fruits as strawberries and black raspberries. Strict anaerobic conditions, however, were not maintained during the time after thawing that feeding tests were made. This may explain why toxin was not found in all cases. It is suggested that toxin might have been liberated during storage as a result of the physical rupture of the spores due to freezing. An experiment was conducted to observe the influence of other organisms on toxin production by *Cl. botulinum*. Types A and B were grown in cherry juice and acidified dextrose broth (pH 4.0) with *L. acidophilus* alone or in combination with this organism and *S. ellipsoideus*. Ninety-six cultures were inoculated, held at room temperature for 5 days and 1 c.c. amounts of culture fed to guinea pigs. Toxin formation was observed in 5 cases: three from dextrose broth inoculated with *Cl. botulinum* A (668) + *S. ellipsoideus*, one from cherry juice, and one from dextrose broth inoculated with *Cl. botulinum* B (437) + *S. ellipsoideus*. *Cl. botulinum* A (637) and Type B (443) did not produce toxin. An experiment was conducted to determine whether freezing would rupture *Cl. botulinum* spores and thereby liberate potent toxin. Washed spore suspensions in sealed sterile ampoules were held at —16° C. and at —79° C. The ampoules were alternately frozen and thawed daily for 4 weeks. Each week 1 c.c. amounts were fed to guinea pigs

to determine the presence of toxin. While in several instances evidence of the presence of toxin was obtained from ampoules held at each temperature, no conclusive proof was obtained that toxin was liberated from the spores of *Cl. botulinum* by freezing. Experiments were conducted to observe whether *Cl. botulinum* could produce toxin in the time elapsing between the canning and the freezing of foods. Non-acid type vegetables and cherries were used for canning and inoculation with detoxified strains of *Cl. botulinum* types A and B. After standing at room temperature for 4, 8, 12, and 24 hours, samples were frozen at —16° C. Bacterial growth was observed after 8 hours. Three days after freezing feedings of 1 c.c. of the material failed to produce symptoms of botulism. Subsequent feedings after longer storage periods gave identical results. It was concluded from these observations that there is little danger of toxin formation in foods before they are frozen and that frozen foods which are eaten promptly after thawing are probably safe. The point was stressed, however, that some growth of *Cl. botulinum* might occur if foods are not frozen soon after canning. The conclusions were that there is very little danger of botulism from frozen foods that are canned properly and used immediately after defrosting. The spores of *Cl. botulinum* are resistant to freezing and once in frozen food may remain there for long periods of time. If foods containing these spores are allowed to thaw and stand at room temperature for several days before using, they may become very dangerous. This is especially true of frozen vegetables.—G. I. Wallace and S. E. Park, *J. Infect. Dis.*, 52:150 (Mar.-Apr.), 1933.

CHILD HYGIENE

THE EFFECTS OF UNEMPLOYMENT ON CHILDREN AND YOUNG PEOPLE IN GERMANY

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THE effects of unemployment on children in the United States have been pointed out from time to time in these columns and elsewhere. We now have available the first of a series of inquiries into the effects of unemployment on children in several other countries.[1] In view of the present situation in Germany it is enlightening to review the report on child welfare from that country. It is planned to set forth in following issues of the *Journal* reports of conditions as found in the other countries of Europe.

There are approximately 6 million registered unemployed in Germany today and it is estimated that there are between 1 and 2 million "invisibles," or unemployed who are not registered.

The recovery of the labor market (on which wilfully erroneous information has too frequently been published) has not led to any reëmployment of idle hands, but has in many cases tended only to the lengthening of the daily working hours of those still in jobs. . . . In December, 1932, the German National Statistical Office published interesting figures concerning average salaries, and from these we learn that the average wage fixed by collective contract fell, between 1929 and 1932, by 19 to 20 per cent. In 1929, 38 per cent of workers earned more than 36 marks a week; in 1932, the percentage was only 19.9. On the other hand, the number of workers who earned up to 24 marks a week rose from 45 per cent in 1929 to 60.9 per cent in 1932.

We quote these figures because they show that unemployment, which has become practically permanent in Germany, has brought about a serious lowering of the average standard of living among the population still at work. Moreover the falling off in the consumption of milk, butter, eggs, meat, wheat, flour, and other farm produce has also aggravated the agricultural crisis.

If we compare the curves of infant mortality in the differing age groups during the past 10 years, with a view to ascertaining the present health conditions of the German child, we arrive at conclusions that do not appear to substantiate the actual degree of economic poverty of large classes of the population, nor the dangers to which the child is exposed. The proper course is to take note of evils when they appear, and before their full effects are apparent in mortality statistics.

In recent years a number of careful scientific studies made among the stricken population showed that, until a short time ago, it was very difficult to prove by accurate statistics that the health of the people in general suffered seriously through unemployment and poverty, but that, nevertheless, no conscientious observer could fail to acknowledge the present needs of individuals or of particular groups. *In times of need, children are always in danger, since any serious fluctuations in the physical, intellectual and moral care they need are a grave obstacle to their normal development.*

With this in view the German Central Union of Private Child Welfare organizations sent out a questionnaire to a considerable number of school physicians, poor law doctors, hospital physicians, family physicians, pediatricians, and directors of municipal Public

1. Weiland, Ruth. The Effects of Unemployment on Children and Young People in Germany, in *Children, Young People and Unemployment*, Part I, Germany, pp. 14–53. U. S., Belgium and Switzerland. Published by The Save the Children International Union, 15 Rue Lévrier, Geneva, Switzerland, 1933. The International Save the Children Fund of America, 156 5th Ave., New York. Price *35 cents*.

Health Offices requesting carefully considered answers to the following:

1. Have you observed an increase of morbidity among the children of the unemployed, as compared with the children of the families in better conditions?
2. Have you observed an increase in rickets among the children brought for the first time to the child welfare clinics or out-patient departments?
3. Have you observed an increase in illnesses caused by cold, and do you think this is due to inadequate clothing or bad shoes as an effect of the unemployment, and the resulting poverty of the family?
4. Have you observed among the children of the unemployed an increase of illness due to lack of cleanliness?
5. Has reduced living and sleeping accommodation among the unemployed diminished the physical resistance of the children (tiredness, lack of enthusiasm for games, reduced power of concentration, etc.)?
6. Have you observed undernourishment, or bad consequences of irregular and faulty feeding, due to poverty rather than to bad housekeeping?

Answers were received from 29 doctors and 3 municipal health officers in 22 towns and districts. Very suggestive information supplementing the medical reports was received from teachers in kindergartens, day-homes, elementary schools and others dealing with the care of children and young people. Social workers and members of private relief organizations also contributed to the value of this study, as the information in most instances was supplied without solicitation.

At the outset two difficulties were met which were impossible to evaluate when any comparison was attempted between the health conditions of children in working and non-working families. In the first place there exist very few statistics on the physical and health condition of these two classes considered separately, and, in the second place:

. . . the apparent standard of living in an unemployed family is not necessarily lower than that of a family where the bread-winner is still at work. Duration of unemployment very largely influences the economic situation of the family.

Unemployment has a direct and indirect effect on child health. The longer it continues, the more children suffer from increasing economic stress. At the outset, the unemployed cut out the greater part, or even the whole, of their expenditure on bodily and intellectual comfort. Very often they move to smaller quarters, a step that in itself has usually a bad effect on the child. No new clothes or underclothing can be bought; and later on the quality, and finally the quantity, of the food is diminished. Careful observations made by physicians in many cases of underfeeding and its fatal consequences show that the unemployed parents have exhausted all possible resources and that acute poverty has set in.

But the children of families still in work are already indirectly, yet gravely, affected by prevailing unemployment. The financial situation of municipal and provincial administrations has, during the last year, become really critical. This is due not only to the large increase in the cost of maintaining the assisted unemployed, but also to the vanishing revenue. On November 1, 1932, 1,849,768 unemployed were supported by the Reich, and 2,046,537 by municipalities and districts. Even were the numbers of the unemployed in Germany to remain stationary, no immediate improvement in the financial situation of the municipalities could be expected, as taxes continue to bring in less and less; some of these taxes produce no revenue whatever, or at best half. In order to guarantee to the assisted unemployed the minimum allocation, in quite a number of municipalities and country districts it was necessary to reduce or cut out entirely all votes for preventive health and child welfare work.

In a study of 43 cities and 44 country districts conducted by the Association of Municipal, School and Poor Law Officers of Health in the spring of 1932 it was found that:

. . . all of these social-hygienic measures had been reduced. The number of infant and preschool child welfare clinics had decreased, the hours of opening were reduced, and medical assistants were substituted by lay persons. Free distribution of milk, cod liver oil and medicinal foods to especially needy cases has been cut down; in Berlin free milk distribution has been reduced by 50 per cent.

School medical examinations, which used to take place four or five times during the school-life of the child, are now often carried out once or twice only or have been entirely abolished. In the fight against tuberculosis budgets have been sometimes cut by half; milk and disinfectants can often no longer be distributed; in many places admission to sanatoriums is being refused; and the work of dispensaries is seriously compromised. In the post-war years the placing of weakly, convalescent, and sick children in homes and sanatoriums proved one of the best means to improve the children's health. A backward trend can be observed from the statistics of the Verein Landaufenthalt fuer Stadtkinder (Country Holiday Fund), which shows that the number of children sent to recovery homes decreased from 215,656 in the 6 months April 1–September 30, 1930, to 128,652 in the months January 1–November 23, 1932.

Public health work suffers greatly from economic measures. In many cases social workers (Fuersorgerinnen) are still employed, but they have so much to do with inquiries into the economic situation of families applying for relief, that they are quite unable to pursue their proper social and hygienic tasks; another drawback of this new work is that it shakes popular confidence in the social case worker. (The German social worker does preventive health work as well as purely social case work.)

The curtailing of preventive measures has, of course, a serious effect on the health of the people, and especially of the children—the more so as in over 40 of the places mentioned the bad effects of the crisis have already been observed on the health of children. This enforced reduction, together with the increasing poverty of families unemployed for a long time, will undoubtedly in the course of the next months produce a disastrous effect on the German children's health. If, up to now, doctors could still report fairly good conditions among the child population, this can be attributed to the valuable and efficient public health system that has operated until recently, and also to the fact that the unemployed families have made use of all their resources.

It should be noted that even at the present time (May, 1933) a number of the leading pediatrists in the large cities such as Berlin, Hamburg, and Dresden maintain that the health of the infants and very young children remains good and that even the school children do not seem to be suffering unduly. They point out, however, that the children between 3 years and school age are showing the greatest strain, both physically and mentally.

In the actual state of affairs, one of the most important assets in Germany, besides the family reserves mentioned above, is the present system of well organized public health work, with an efficient medical service dealing with the care, feeding and education of the infant, the preschool child, and school child. Proof of the real or apparent private reserves, either exhausted or still available, may be seen in the very slow decline of the general health standard. The value of small allotments, where vegetables, fruit, and potatoes can be grown, is considerable. These advantages compensate the winter discomforts of the small huts built in these allotments: space restrictions, bad lighting, inadequate heating, etc. During many months in the year they give the children the possibility of living and playing in the open. Many city families have developed contacts with country relatives and friends. Private organizations and neighbors help now and then. Any belongings of value are pawned. *The most important reserve, however—and the complete consumption of which is vitally serious—is the mother's physical and moral stamina.* . . .

From medical reports we gather that, until recently, no lowering of health standards could be observed among children, contrary to observations made during the war, when the consequences of immediate lack of food were speedily evident. But today nearly all doctors agree that the normal rise in the standard of child health has come to a dead stop, or has fallen. . . .

According to a Memorandum on health conditions of children in Prussian elementary schools (Preussisches Ministerium fuer Volkswohlfahrt, 1932) a falling off in the nutrition of children has been observed only since the autumn of 1931. . . . Many school teachers, kindergarten teachers and social workers call attention to the growing hunger of the children and all its consequences. . . . Professor Gastpar reports that the upward trend in child health in Stuttgart has come to a dead stop, that there is a marked fall in the nutrition of new pupils, and that active tuberculosis has much increased among school children since 1928.

German medical experts have not yet arrived at a unity of views on the unfavorable influence of parental unemployment on the health of the child. The ill effects of unemployment do not appear everywhere with the

same rapidity, because family resources vary largely (garden plots; relations in the country; remunerative employment of the mother; clandestine work), and also because the length of unemployment is an important factor. The proof that ill effects have greatly increased during the past 2 years can be found in the answer given to the *Deutsche Zentrale* by a large number of doctors who have experience among the unemployed. Contrary to the medical inquiry, the one made among a very large number of teachers of all denominations and political views, kindergarten teachers, heads of day-homes, social workers, and leaders of child welfare organizations, has stressed the fact that educational conditions are far more serious in the unemployed than in the working family.

All age groups, save the infant, are affected, and even the baby can suffer from nervousness and lack of mental balance in its surroundings. Among children of preschool and school age, the damage caused is already so obvious that the united efforts of all public and private child welfare organizations are needed to ward off further and serious evil from the young generation. In many cases it is already impossible to repair the damage done. We must here take very serious exception to the view that the effects of poverty are identical in all families whether they are unemployed, or working for insufficient wages that are scarcely better than the dole. Even when resources are reduced in both cases to a pittance, the rhythm of life is entirely different in a family whose members are idle. In an article published in the *German Red Cross Review* (Wirtschaftsnot und Volksgesundheit. Blaetter des Deutschen Roten Kreuzes, Berlin, December, 1932), Professor Fritz Rott states that the mental balance of the unemployed is seriously disturbed. "Increased neurosis is perhaps the most serious danger to health caused by the present crisis. This increase is not sufficiently taken into account, because it is not easily recognized."

PUBLIC HEALTH NURSING*

Visiting Nurses and Communicable Disease—Back in 1923 Haven Emerson, M.D., of New York, said:

It would appear that many cities do not advise concurrent disinfection in either the major or minor communicable diseases, whereas instruction in the need and in the simple household technique of this procedure is well nigh universal wherever visiting nurses in public or private employ are permitted to give bedside care. Without concurrent disinfection little of real value to the members of the household follows from the procedures of isolation and quarantine. This is the one essential and elementary precaution in every sick room where there is a case of communicable disease. In the interest of the patient, the attendant, the other persons in the family or household, concurrent disinfection is of infinitely more value than terminal disinfection or the mere separation of the sick person in a room apart. Concurrent disinfection of discharges throughout the period of communicability of the disease is the chief object of isolation. Where it is neither taught nor practiced, isolation is profitless.

The Superintendent of Nursing of the Metropolitan Life Insurance Company reported in this magazine this spring that in 1931 her company had expended more than $4,000,000 for home nursing service to more than 800,000 of its own policyholders. In a close analysis of 200,000 of these it was found that only 5 per cent of the visits were made to patients suffering with measles, scarlet fever, whooping cough, diphtheria, and other communicable diseases, showing that visiting nurses are not doing this work to any extent. Is it because health commissioners do not see the possibilities or because they do not take advantage of them when they do see them?

Now comes the report of a survey of the Communicable Disease Hospital

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

needs of the Borough of the Bronx, City of New York. The Henry Street Visiting Nurse Service has included the care of acute communicable disease on its program for 15 years. Of the 9,366 communicable disease cases cared for from 1927 to 1931, inclusive, measles constituted 52 per cent; diphtheria, 9 per cent; scarlet fever, 21 per cent; and whooping cough, 18 per cent.

The cost of the Henry Street Visiting Nurse Service is $1.15 per visit and the average number of visits in 1931 was 6.2 visits per case, representing an average cost of $7.13 per patient. At the Willard Parker Hospital, where most of the Bronx communicable disease cases go, the average cost of hospital care of each case of diphtheria in 1930 was $171; scarlet fever, $234; measles, $85; and whooping cough, $194.

The survey states: "The low mortality among the patients under private medical care using the nursing service bears eloquent testimony to the favorable results of a high quality of visiting nursing in the care of contagion. The ratio of deaths to cases is extremely low."

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A Survey of the Communicable Disease Needs of the Borough of the Bronx, City of New York. New York City Visiting Committee of the State Charities Aid Association.

Every Public Health Nurse Should Have a Set—A new set of five sex education pamphlets written by Dr. Thurman B. Rice replaces an older series published by the American Medical Association. The set consists of: The Story of Life (For boys and girls 10 years of age); In Training (For boys of high school age); How Life Goes On (For girls of high school age); The Age of Romance (For young men and women); The Venereal Diseases (For both sexes, high school age or older).

Dr. Rice holds to the fundamental principle that civilization is founded on the home, yet he faces the fact that when young people come to learning about the processes of procreation they will no longer be satisfied with sophistry. He has taken the position that there can be no ignoring or isolating sex because it is so deeply interwoven with the mental, moral, and spiritual as well as the physical life.

The pamphlets reflect Dr. Rice's belief that no man or woman can understand his or her own sexual life and problems without understanding those of the other sex as well. He writes about sex for little children of both sexes in one pamphlet and uses the same methods in speaking to adults. He addresses high school boys and girls separately but teaches the same fundamental lessons to both groups and gives each a glimpse of physiology and psychology of the other sex. Yet he gives no descriptions or diagrams of sex organs; only such references to physiology as are needed for the discussion.

"The pamphlets are not medical treatises but intensely human and practical documents which display a real grasp of the needs in this field of health education."

Parents should use the pamphlets as a supplement to the confidential personal teaching necessary to transmit knowledge of sex to their children. They should read them first then turn them over to their children according to age. Teachers will find them useful for their own information and for the occasional instances when they have to function because the home has failed to do so. Doctors will find the set useful to recommend to parents.

The pamphlets are attractively printed and illustrated. The price is $1.00 for the set of five or 25¢ for each

pamphlet.—Sex Education Pamphlets, review by W. W. Bauer, M.D., Am. Med. Assn., *Hygeia,* XI, 6:561 (June), 1933.

Nurses Save Taxpayers—How to save the taxpayers of the state, and at the same time give adequate relief to those in need—that is a problem which has taxed the ingenuity of both local and state relief officials.

Medical and nursing care for relief clients who are sick at home are classed as necessities of life, along with food, shelter and clothing, under the emergency relief act passed in New York State in 1931.

In many communities in the State, large sums of money have been expended to provide hospital care for relief clients who were unable to get adequate nursing care in their homes. In 1931 and 1932, some communities spent more of public funds for hospital care than they spent for all items of home relief—food, fuel, clothing, etc.

Both urban and rural physicians have cited instances in which, for the sake of safety, patients, not critically ill, have been sent to the hospital for a week or more at a time, simply because competent bedside nursing service was not available to the patients in their homes. The cost of a week in a hospital ranges from $17.50 to $38.50, with the average well over $20 per week. In the few communities where visiting nursing service was available, a patient who would otherwise be sent to the hospital, was given competent care in the home for a fraction of the institutional cost.

The great need for nursing as well as medical care in the homes of the unemployed was strikingly shown in a sickness census made last December by the State Department of Health at the request of the State Temporary Emergency Relief Administration. It was found that while sicknesses were not much more numerous among the families of the unemployed, they were, however, more prolonged. More than 40 per cent of those disabled by illness on the day of the census had been ill for more than a year. Among those who had been ill for less than a year, the average illness lasted more than three weeks.

On the basis of this report of sickness and a study of unemployment among qualified graduate nurses in the State, the Temporary Emergency Relief Administration made an allotment of funds to the State Department of Health, to inaugurate, under its supervision, a statewide system of bedside nursing for relief clients sick in their homes.

Since the middle of February almost 200 nurses have been employed at a weekly work relief wage of $17.50 per week to give home bedside nursing to relief clients in more than half of the welfare districts of New York State. The allotments were based on the community needs for bedside nursing, the availability of qualified nurses in need of work, and the assurance that competent nursing supervision could be given locally.

This project, therefore, has been one of "double relief," both for the nurses and the sick.

The devoted work of these nurses has been revealed in numerous letters from patients, welfare officials, and nursing agencies. In one family, the parents of a sick child wrote that they felt the expert care given by the work relief nurse had saved the life of the child. In an upstate city, both state and local health authorities felt that the aid given by these nurses was invaluable in controlling a serious epidemic.

In several cites these nurses have aided the welfare officials in making sure that all the young children in needy families get fresh milk, cod liver oil and other protective foods so necessary to insure normal growth and devel-

opment, and to prevent the crippling effects of malnutrition and undernourishment.

These nurses have been very active in the statewide campaign to protect each and every young child from the ravages of that age-old enemy of childhood, diphtheria. Has your child been protected by having 2 doses of toxoid or 3 doses of toxin-antitoxin? The treatments are both safe and painless.

These nurses do save taxpayers. They save money by reducing hospital expense and lengthy periods of medical care. They save future misery and illness by giving health instruction to parents in their homes. They save lives by aiding in the protection of children against diphtheria and malnutrition, *and*, they insure ample dividends in the increased health and happiness of a great many citizens of this State.—H. Jackson Davis, Nurses Save Taxpayers, *News Service*, New York State Dept. of Health, Radio Talk No. 594, Tuesday, May 16, 1933.

EDUCATION AND PUBLICITY*

What to Say About Low Death Rates in the Depression—An outstanding problem in public health publicity and interpretation just now seems to be to get public opinion back of reasonably high standards of public health work in face of the generally low death rates which seem to make retrenchment much more safe than it really is. Dr. W. W. Bauer has contributed an excellent article on this subject called "The Death-Rate in the Depression," American Mercury, May, 1933, the whole of which all health workers will wish to read. He answers a frequently expressed defense of depressions with force:

> The thought has also been advanced that enforced retrenchment in matters of food, in burning the candle at both ends through high-pressure business and hectic social activity, and in dissipation, will be effective in improving the health of the American people. Perhaps a few gourmands may be prevented from digging their graves with their teeth quite as fast as they might like to do; possibly a number of foolish debutantes are restrained from dancing themselves into a tuberculosis sanatorium or an early grave; conceivably business men now have less occasion to drive themselves to physical bankruptcy for the sake of piling up profits. But must we have a Depression that threatens the integrity of the whole world for these infinitesimal gains, doubtful benefits at the very best? Such arguments are the acme of futility.

Another magazine article on the general question of stabilizing health department income is "Defending Health Budgets" by Paul O. Komora, Hospital Social Service, May, 1933. It can be had in reprint form from National Committee for Mental Hygiene, 450 Seventh Ave., New York City.

National Award to Birmingham's Health Department—*Birmingham's Health*, the bulletin of the Birmingham, Alabama, Health Department received one of five awards given this year by the Social Work Publicity Council. This was the only award in the public health field, the other citations going to the Survey Graphic; the Cincinnati Community Chest for its Women's Crusade; Chicago Council of Social Agencies for its News Letter; and the Welfare Council of New York for its newspaper publicity interpreting a study of boys' recreation needs in Brooklyn.

The citation to Birmingham reads:

> It takes courage on the part of a health officer to speak out as openly about health dangers as about accomplishments because most communities are ostrich-like, squeamish about the possibility of injuring civic reputation. It is the quality of the frankness which shines from the pages of *Birmingham's Health*, the bulletin of the Birmingham, Alabama, Health Department, that wins admiration. The bulletin has been plain-spoken especially during the last twelve months about the dangers courted in cutting appropriations for health work, putting its messages on a wholesomely constructive basis. "Disease dies

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

He is the best leader who most fully understands the nature of things, so that his plans are not doomed to ultimate failure; who possesses an active, far-ranging imagination which can see many possibilities; who has a sense of values, so that among possibilities he is able to choose the most excellent; who has a sense of order, to give form, design and program to the values and purposes he selects; who has practical sense and judgment, and so uses the most feasible means to accomplish his ends; and who has the energy and enthusiasm to carry his plans persistently toward fruition.—*Antioch Notes*

down only when fought; and fought with time, energy, and money. Clean milk can be obtained only by paying for inspectors, veterinarians and laboratory technicians. Mosquitoes cannot be eliminated with propaganda and ballyhoo, but only with oil, drainage and hard labor."

Another of its commendable franknesses is in this matter of the current favorable health figures and the over-confidence this may bring. "We must not deceive ourselves. . . . If present day conditions . . . continue, we shall encounter a desperate tomorrow. With all the mobilized forces of science in a nation at war, the want and distress of 1914–1918 is reflected still in the health of the children of Central Europe born during these years. With less than the very best of modern science as expressed in preventive medicine and public health from the want of 1929–1933 will come a depression in health and strength and life which will last half a century."

This courageous health information is attractively presented. The bulletin has the feel of a friendly visitor who would be welcome in any household. The articles are brief; the subject matter pertinent and well selected. The style is straightforward, inspiring confidence, and while impersonal, it seems to speak directly to the individual reader. Yet it does not make a strained attempt to "personalize" the printed word.

The arrangement of the material is good. On the front page is a picture or graph. The inside cover page is a directory of the department personnel, stating plainly the room number and telephone extension, and on the back page current statistical facts. The typography and layout contribute much to make this bulletin noteworthy. Large, readable type and plenty of lead and margin space lure the reader on. Before he knows it he has read the entire bulletin. The use of modernized Roman for the headings gives it an up-to-date and fresh appearance.

Some of the cover pages are striking. The issue of April, 1932, makes excellent use of a graph in three dimensions. Clever and timely is the jigsaw design of the April, 1933, number, visualizing for the lay reader how little of the medical dollar is spent for public health.

Our congratulations to Dr. J. D. Dowling, and K. W. Grimley, bulletin editor.

Reconstruction As of 1934—Keynote—Each year the National Tuberculosis Association and its affiliated associations emphasize one aspect of tuberculosis control. This has come to be known as the Early Diagnosis Campaign. Reconstruction of public health will be the central theme in 1934.

Disaster has been averted by shoring up banking, industry, farming, and other institutions mercilessly shaken by the depression. It is time to reconstruct. Public health, never a sturdy enough structure, has suffered violent shocks. Patchwork will not do. Rebuilding on the solid foundation of modern medical knowledge is the best course. It will be the purpose of the campaign to show that by modern methods health can be secured. While tuberculosis organizations will emphasize the need of providing tuberculosis control facilities, it is hoped that all health agencies will participate in sounding the reconstruction note.

H. E. K.

The Second Health Education Institute—Dr. Iago Galdston will again direct the Health Education Institute, the second to be conducted by the Health Education Section. The dates are October 7 to 9, 1933, immediately preceding the American Public Health Association meeting at Indianapolis.

The theme proposed for this year's Institute is "The Psychology of Health Education." Three lectures will bring out principles of group education including motivation; application of psychological principles to definite health education instruments with examples and critical examination and analysis of existing health education materials.

In two round table sessions definitely assigned projects in health education will be discussed.

It is proposed to limit the student body to 60, with the whole group listening as a unit to the three lectures, and separating for round tables according to some convenient classification.

The "Jig-Saw" Simplified—Under another heading in this issue we are reminded of difficulties in deciding "what to tell the public."

An assortment of short articles believed to present what is true, insofar as we know what is true in the early months of 1933, comes in "What to Tell the Public About Health," recently issued by the American Public Health Association, 450 7th Ave., New York.

This collection of about 200 short articles is reprinted from the later issues of *Public Health News*, the monthly syndicated bulletin edited for the A.P.H.A. by John Hall.

The articles may be used as is. Paragraphs and sections may be copied. Any of the material may be re-written in the particular style of the individual health educator. The "Foreword" by Ira V. Hiscock points out some use possibilities.

A section on "Organizations That Supply Health Education Material" should prove useful. Discrimination will need to be exercised in making selections from the educational offerings of manufacturers included in this directory. The 9-point classification offered by T. J. Edmonds should be applied to what we accept from the business world for distribution.

"The Jig-Saw Puzzle of Health Publicity"—Under this title T. J. Edmonds has discussed in a conference paper an experiment he has made in checking newspapers and magazines for evidences of interest in the subject of health.

Here is what he discovered:

In the issue of Liberty of April 22, 1933, there were 24 advertisements. Twenty of these contained a health motive. Following are a few of the catch phrases:

Mouth happiness.

Squibb minded.

No time to neglect health. Be safe and fight colds.

Antiseptic kills germs even when it is diluted.

So easy on the hands.

Hair today and gone tomorrow.

Tones and strengthens your intestines.

Rich in vitamins B, C, D. The kind doctors advise.

Women call these wonderful tablets the internal cosmetic. They remove the inside cause of blemishes, pimples, headaches and that general run down feeling.

Brighten the eyes and clear up blood-shot condition.

One drop stops pain instantly.

Stop dandruff the pleasant way.

Corrects eczema, ringworm, pimples and rash.

Happy legs are here again.

Tums for the tummy.

Next I tore a page at randum out of the Sunday issue of a metropolitan daily. It contained beside reading matter five display advertisements. The subject matter was as follows: "Bright woman lost 20 pounds"; Find why your feet hurt; The girl who had never been kissed, title; reading matter beginning "If you think yellow unsightly teeth are natural . . ."; The dread body odor no longer; The new Saxon-weave suit. Four out of five on the health motive.

This and other instances demonstrate interest in health but Mr. Edmonds finds little discrimination shown in the sources from which material is taken and its soundness. He classifies the published material under nine groupings as:

1. The knowingly false
2. Deliberately distorted
3. Wilfully exaggerated
4. Carelessly misrepresented
5. Hastily generalized
6. Honestly misinterpreted
7. Insufficiently checked
8. Incompletely proven
9. Scientifically established

Commenting on these groupings, Mr. Edmonds says that No. 1 can be safely left to the American Medical Association; groups No. 2 to No. 5 are:

an enormous and powerful assemblage, backed by money, organization and respectability. In the field of health publicity more than in any other, the public has been the victim of misleading publicity—some of it sincerely

mistaken—some of it carelessly regardless of the necessity of proof—some of it deliberately synthetic. . . .

Some catch-words that proclaim a pernicious philosophy have become popular—partly because they expressed an honest misconception that was popular. Such was "Don't sell America short," and such is, "Buy American." . . .

The same philosophy applies to catch-words in the health field. Some brevities are true or almost true—but it is the rare one that is righteous—it is an almost impossible task for the advertising artist to produce a sententious generalization that tabloids a truth in terse and striking terms.

Moses did it in the ten commandments. Christ did it in the beatitudes. Both of these sets of eternal brevities were composed on a mountain top. And occasionally some seller of good goods, some propagandist of a great idea, some missionary of a righteous cause, climbs up the arduous mountain slope of fact to the peak of inspiration and utters truth in words simple and few.

In groups No. 6, No. 7, and No. 8 Mr. Edmonds finds that social workers and health educators have been guilty and he cites some of the fallacies in our health slogans.

. . . Health workers often honestly draw misleading inferences from statistical trends. The trouble is that they do not use a control group. Here is an interesting instance of a correct conclusion reached by illogical methods. We have tried to demonstrate the adage, "Public Health work pays," by citing decreases in rates after certain work was begun. That didn't prove it. A parallel is not proof, and it is a common error to confuse sequence with causation. But the same conclusion has been proved by correct scientific methods. . . .

Many of us, I confess, have been guilty of trying to alarm the public about the increase in the heart disease death rate. Our motive was good—that heart disease in many respects is similar to tuberculosis and that it will to a limited degree respond similarly to a public health program aimed at reduction. And by such methods it has already been reduced in some states.

But our ballyhoo is vulnerable in several respects—and in our enthusiasm we have overbid our hand. In the first place heart disease is an embracing term. It includes a lot of separate forms of disease—all of the circulatory system, it is true. . . .

If all the ailments of the respiratory system were grouped together in vital statistics that disease, whatever it might be called, would be the leading cause of death instead of heart disease. . . .

So statistics are like mattresses—it always pays to slit them open to see what they are made of. Statistics are true only if properly interpreted, interesting only if humanized and valuable only if rightly used.

Now that we have discarded so many of the pieces of our puzzle you ask naturally if there is anything left out of which we can fit a publicity picture. Are we safe in saying anything?

One good rule is to play the game with the medical profession. If we make propaganda out of facts endorsed by scientific medicine, we will either be right or wrong in mighty respectable company. If we do not travel too far ahead of public knowledge—just a little in advance in the right direction—we are about as safe as one can expect to be in this changing world.

There seems to be a zone of white light wherein dwell facts that are well demonstrated and accepted by majority opinion. Few people now question the efficacy of immunization against smallpox and diphtheria. Few deny that safe water and safe milk have something to do with typhoid. No one will dispute the advisability of maintaining general bodily resistance. Whatever may be said about pasteurization and tuberculin testing I have heard no attack on mother's milk. Variety in foods producing something like a balanced diet appeals to our gustatory sense as well as our aversion to monotony. Brushing the teeth is defensible on esthetic grounds at least. Exercise brings its own easily recognizable reward, and loss of sleep its own punishment. Whether wet or dry politically we prefer that the man driving down the road toward us shall not have mixed too much alcohol with his gasoline. Although not frightened by the B.O. advertising we will at least agree that an occasional bath counteracts to some degree that peculiarly offensive racial aroma of the Caucasian. I never saw a vitamin, but I know that orange juice and prunes ultimately and indirectly improve one's disposition. And I wouldn't be without a first aid kit, a thermometer and a box of kleenex or its substitute either in a home or school.

And there's one slogan that I believe is a safe generalization: "The early diagnosis may catch the germ." There may be more.

So there are plenty of things we can say—

safely. Let's say them over and over in new ways. And the doubtful things we might discuss, saying "So-and-so says," or insuring ourselves against embarrassment by that convenient newspaper joker, "It is alleged."

Nutrition Demonstrations for Relief Workers—A series of nutrition demonstrations designed to instruct social workers and nurses how to advise families faced with the problem of selection and preparation of food with minimum expenditure was recently organized under the auspices of the Newark Welfare Federation.

The coöperating agencies included the nutrition department of the public schools and the Essex County Tuberculosis League.

The assistance of the Director of Home Economics for the Public Service Corporation and the Home Demonstration Agent of the State Department of Agriculture was obtained by the Committee. The Public Service Corporation donated the use of its centrally located demonstration kitchen and a part of the food used. Flour was given by the Red Cross and the remaining expenses paid by the Welfare Federation. Newspaper publicity was arranged by the Essex County Tuberculosis League.

The program was designed to cover foods essential to health under emergency conditions and protective foods as well as economies in fuel, labor and equipment.

New Popular Movies on Milk and Diphtheria—Two new motion picture films, one on milk and the other on diphtheria, have been added to the loan library of the State Department of Public Health. They are available on 16mm stock only. The diphtheria picture is one reel in length, requiring about 15 minutes for screening. The milk picture is two reels in length and requires half an hour for screening. Both were made by the State Department of Public Health and relate altogether to Illinois conditions. The photography was done by Dr. A. C. Baxter, assistant director of the Department.

The picture on diphtheria shows step by step how the medical profession and the health officials come into action when a case of diphtheria develops. Each essential procedure in the management of a case of diphtheria, from the moment when a physician is called by the family to the termination of quarantine, is brought out. This, of course, includes the taking of specimens for laboratory examination, treatment with antitoxin, quarantine, protection of contacts, etc. The importance of toxoid in protecting children is also emphasized as a feature of the picture.

The picture on milk relates to both production and distribution. All of the scenes are of farms, dairies and pasteurizing plants in Illinois. Every important step in the production and distribution of milk is shown with particular emphasis upon those processes, such as pasteurization, laboratory testing and bottling, which protect the consumer from unsafe or contaminated milk.

These pictures are available on loan without local cost in Illinois.—B. K. Richardson.

New Movie for Medical Audiences—A new motion picture film on approved methods and technic of taking and mailing specimens for diagnostic laboratory examination has recently been completed by the State Department of Public Health and is now available on 16mm stock only. Two features of the picture deal with taking specimens for the diagnosis of whooping cough by the cough plate method and of taking specimens that may be mailed for dark field examination. Other parts of the film show the technic of taking and the appropriate way to prepare for mailing blood, sputum and

other specimens for tests relating to syphilis, tuberculosis, typhoid fever, gonorrhea, malaria, diphtheria, etc.

A lecturer from the Department is available to discuss subjects covered in the picture. This motion picture film was made especially for the medical profession. It is available for the use of medical societies in Illinois without cost.—B. K. Richardson.

Where East and West Meet—From where this is written Honolulu seems to be near the end of the world—with a new world just beyond to the west.

But the Child Health Day edition of *Honolulu Star-Bulletin* looks like a special edition from any good sized home town. Advertisements and illustrations maintain the illusion of a nearby community. Articles by Health Department and Education Department officials and others complete the picture. One good story tells how a physician-father built up a backyard playground and garden for a young son. Philip S. Platt tells about Palama Settlement health work, and James G. Stone, Tuberculosis Committee and other health education activities, assembled the edition.

BOOKS RECEIVED

THE VITAMINS IN HEALTH AND DISEASE. By Barnett Sure. Baltimore: Williams and Wilkins, 1933. 206 pp. Price, $2.00.

GASTRIC ANACIDITY: ITS RELATION TO DISEASE. By Arthur L. Bloomfield and W. Scott Polland. New York: Macmillan, 1933. 188 pp. Price, $2.50.

THE CLINICAL ASPECT OF CHRONIC POISONING BY ALUMINUM AND ITS ALLOYS. By Lep Spira. London: John Bale, Sons & Danielsson, 1933. 28 pp. Price, $.75.

EPIDEMIOLOGY IN RELATION TO AIR TRAVEL. By Arthur Massey. London: Lewis & Co., 1933. 59 pp. Price, $2.00.

THE DYNAMICS OF THERAPY IN A CONTROLLED RELATIONSHIP. By Jessie Taft. New York: Macmillan, 1933. 296 pp. Price, $2.50.

DIET IN SINUS INFECTIONS AND COLDS. By Egon V. Ullmann. New York: Macmillan, 1933. 166 pp. Price, $2.00.

NOTES ON VITAMINS AND DIETS. Daniel Thomas Quigley. Chicago: Consolidated Book Publishers, 1933. 128 pp. Price, $1.00.

SEX EDUCATION PAMPHLETS. THE STORY OF LIFE, IN TRAINING, HOW LIFE GOES ON, THE AGE OF ROMANCE, THE VENEREAL DISEASES. By Thurman B. Rice. Chicago: American Medical Association, 1933. $.25 each, Set $1.00.

IOWA WHITE HOUSE CONFERENCE ON CHILD HEALTH AND PROTECTION. April 14 and 15, 1932. Des Moines: Iowa Pupils Reading Circle, 1932. 506 pp. Price, $1.95.

BOOKS AND REPORTS

Directory of Psychiatric Clinics in the United States—*Compiled and edited by the Division on Community Clinics of The National Committee for Mental Hygiene. New York: The Commonwealth Fund,* 1932. 165 pp. Price, $1.00.

This is the third edition of a very useful reference book for all those interested in the development of psychiatric services for children, neurological clinics, and mental hygiene societies. For convenient reference the material is arranged alphabetically by states and localities within each state. "No attempt is made to evaluate the service of the clinics, but the Directory does indicate the type of organization and the scope of the work in each case." Private clinics do not come within the purview of this survey.

Of the 674 clinics listed in the Directory, 232 have staffs made up of a psychiatrist, psychologist, and psychiatric social workers. About 50 clinics serve adults exclusively. Since the 1928 Directory was published, there has been a net increase of 130 clinics for children.

The first section of the Directory outlines the mental hygiene activities of the federal government, including a list of the neuropsychiatric hospitals operated by the Veterans' Bureau and naming the officers in charge.

The foreward states that "a further service relative to the work of clinics may also be mentioned. The generally recognized desirability of comparable records and statistics led to an effort in this direction by the staffs of the clinics operating under the Commonwealth Fund demonstration program. This work was under the supervision of Mary Augusta Clark, research statistician of the former Joint Committee on Methods of Preventing Delinquency, and now of the Commonwealth Fund. Advisory statistical service has been given not only to the demonstration clinics but also to the resulting permanent clinics in the various communities. Other clinics as well have shown interest in this work and have sought counsel and help, which is given to the extent permitted by Miss Clark's other duties. *Recording and Reporting for Child Guidance Clinics* (published by the Commonwealth Fund in 1930), represents the accumulation of tried statistical methods of child guidance clinics and is recognized as the standard guide in this field.

RICHARD A. BOLT

Twenty-First Annual Report of the International Association of Dairy and Milk Inspectors—*Compiled by Paul B. Brooks, M.D. Albany, N. Y.: State Department of Health,* 1933.

This report contains much of unusual interest and value, and deserves a wide circulation not only among those directly concerned in the production and handling of milk, but also among health officers and physicians.

We would direct especial attention to the article by W. E. Krauss, of the Ohio Agricultural Experiment Station, showing that according to biological assays, the pasteurization of milk does not injure its nutritive qualities except for a partial destruction of vitamins B and C. Since pediatricians and physicians have generally been furnishing supplementary diets to guard against this, their partial destruction is not a serious problem.

Deserving of special attention is the

symposium on Nutritional Quality Developments in Certified Milk, and the Reports of four Committees on Communicable Diseases Affecting Man, Milk Plant Practice, Sanitary Control of Ice Cream, and Food Value of Milk and Milk Products. The last is extremely valuable, being a critical review of some 71 different articles.

While these have been selected as being of particular interest and importance, the whole report is made up of papers of unusual excellence.

The importance of milk in nutrition is so well recognized and methods of handling it, fortifying it, and modifying it are being proposed so frequently, that all should be glad to have authentic pronouncements upon it.

MAZŸCK P. RAVENEL, M.D.

Research on the Constitution of the Japanese with Special Reference to the Physical Capacity—*By Dr. Yukinobu Yoshida, Expert in the Japanese Governmental Institute for Research of Physician Training, "School Hygiene," July, August, September, October and November, 1932, Imperial School Hygiene Association, Tokio,* 200 pp.

This report is written in Japanese. The author not only writes of his own researches regarding anthropometry in the last 7 years, but also presents the work of others. Dr. Yoshida studied height, weight, chest girth, the difference of chest girth between respiration and expiration, abdomen girth, upper arm girth, thigh girth, calf girth, back strength, grasp strength, shoulder breadth, hip breadth, chest depth, length of legs, length of arms, pulse rate before and after exercise, blood pressure, lung capacity and thickness of skin, measuring 160,000 school children (elementary, high, and college boys and girls), athletes, soldiers and laymen. Much attention was paid in eliminating error from each item; for example, error by apparatus or posture, and time difference in measuring height.

The tables of the Japanese averages are from 6 years to 18 years and cover the following items:

Average height according to the age
Average weight according to the height and age
Average lung capacity according to the height and age
Average chest girth according to the height and age
Average back strength according to the height and age
Average increase and recovery of pulse rate after the exercise (20 times the knee bending), according to height and age

Suggestions were given to improve each physical strength, and the importance of chest girth and lung capacity with regard to the health was noticed.

Thus Dr. Yoshida discusses the Japanese constitution from the standpoint of physical capacity, and compares these measurements with those of other nations. He concluded that the Japanese physical capacity is not very low until 17 years, but distinctly low in adults, although there has been an increase in height and weight of Japanese adults 20 years of age, as shown in the following:

	Height	*Weight*
1910	61.9	114.4
1920	62.4	115.6
1930	62.8	117.2

YUZURU NOZU

The Policewoman's Handbook—*By Eleanore L. Hutzel, assisted by Madeline L. Macgregor. New York: Columbia University Press,* 1933. 303 pp. Price, $2.00.

In cities progressive enough to have them, policewomen are important factors in the warfare on crime, particularly as it is concerned with the protection of women and children and the prevention and control of sex offenses. The duties and responsibili-

ties of these specialists in this field of social work have been ably set forth in this excellent book. It discusses such pertinent topics as patrol and inspection, undercover operations, investigation of complaints, criminal law procedure, the preparation of cases for courts, evidence, and detention. Several interesting chapters are devoted to case reports, while appendices give time schedules and sample records. The book is well printed, has a comprehensive bibliography, and a good index. Social hygiene workers should find it of great value. JAMES A. TOBEY

Why We Do It—A Study of Normal, Subnormal, and Abnormal Human Behavior—*By Arthur R. Daviau, M.D. Boston: Meador Publishing Co.*, 1931. 231 pp. Price, $2.00.

The author's chief thesis is that, in most instances, people in the practical field of human behavior have taken a theory and then adjusted the facts to coincide. Interestingly enough, the author seems guilty of the same fault for which he criticises others. In the first part of the book, he is particularly critical of Dorsey's work *Why We Behave Like Human Beings*. His criticisms are aimed particularly at Dorsey's interpretations of his material. However, the author also disapproves of the methods used by education, religion, psychology, psychoanalysis, and public health. In most instances he presents no data for his own conclusions which are, for the most part, his opinions.

His willingness to generalize from the statement made by one person is shown by the following (page 215): "A psychologist once said 'The most obscure race of people on the face of the earth today is youth. Nobody understands them.'" On this statement, the author then generalizes and concludes (page 217): "According to psychology, youth is a riddle, an unsolvable problem; and psychologists, apparently, at least, admit that they can do nothing for youth."

He manifests a rather evident lack of familiarity with his subject in general as indicated by his use of such terms as "subnormal behavior" and "abnormal behavior," neither of which he defines, and also with many of the problems which he discusses, for example, when he states (page 221) ". . . mental defectives who in reality are partially insane."

Interestingly enough, he criticises the educational approach because it is too greatly characterized by the use of psychological principles since (page 41) "The teachings of psychology have been rebuilt in the last decade," it should not have the influence it has in education or the training of children. He regrets exceedingly that eugenics is not given a more important field in the sense that it deserves.

The author also seems to believe that there is an undue tendency (page 80) "to boast of the general lowering of the infant mortality rate in the United States . . ."—and without giving any proof or facts, he concludes (page 81) ". . . one would be justified in believing that our infant mortality rate is being lowered most pronouncedly in and among the mental defectives. . . ." It is surprising that a public health officer, in his desire to emphasize the all important rôle of heredity, would ignore that a great deal of the lowering of the mortality rate is an accomplishment of preventive medicine and not of welfare work among mental defectives, and that such diseases as diphtheria, smallpox, typhoid fever, and the like, are not respecters of race, creed or intellectual level.

Another example of the author's interesting method of drawing conclusions is shown (page 63) in discussing a report on state wards, where he quotes ". . . 64 per cent were

taken away from their parents due to marked neglect; 15 per cent due to cruelty on the part of the parents; 11 per cent due to habitual exposure of children to immorality; 10 per cent were orphans." The author then concludes: "From the above tabulation, it can readily be seen that, discounting the orphans altogether, we have at least 90 per cent of the state wards who are the descendants of mentally deficient parents." This deduction is rather indicative of the author's lack of adequate appreciation of the motivation underlying human behavior.

This is further shown in the following statement (page 82): "From her (public welfare worker) statement that neither the father nor the mother wanted the child, I was inclined to believe that this child was illegitimate. . . ." Unfortunate as it may be, studies of family situations reveal that other than feeble minded parents not infrequently have children they did not desire. Neither is it unusual for the mother of an illegitimate baby to be extremely fond of her child.

In the second part of the book, the author presents his own theory of human behavior and posits as the basis the existence of "psychical (mental) originators and the psychical (mental) center of associations." He mentions in this connection love, virtue, vice, belief, courage, bravery, color, thought, etc. This theory of the author has something of the familiar ring of phrenology.

The author also presents his own theories on sleeping, dreaming, and being awake.

This volume offers little of scientific value to the worker in the field and is but a presentation of a eugenic viewpoint the author himself has developed primarily on the basis of his 5 years' experience as a public health officer and city physician. He presents no scientific research to justify his conclusions which are, for the most part, opinions and assumptions. The book, however, is very interesting reading, although a great many actively working in the field will disagree with many, if not most, of the author's own theories and his quite general denunciation of most of the existing ones.

FRANK J. O'BRIEN

A Decade of District Health Center Pioneering: A 10-Year Report of The East Harlem Health Center —*New York: Published by the East Harlem Health Center, Inc., and the New York Chapter of the American Red Cross,* 1932. 148 pp. Price, $1.00.

The East Harlem Health Center is one of the notable demonstrations in New York City showing the advantages of operating a department store in health. When it was started in 1921 it did not have the financial stimulus of a large fund such as Mr. White left to Boston. It did have the backing of the American Red Cross for an experimental period of three years after which five foundations provided most of the money. There was no special building erected to fossilize mistakes in theory before experimental evidence through actual work had accumulated. Eventually, in three remodeled houses, twenty-one organizations found headquarters and certain facilities in common. Having completed a decade of work, it is now proposed to turn this health center over to the city of New York as a going concern to be housed in a special building the city fathers are to provide if and when able to do so.

In readable fashion, this illustrated report tells the fascinating story of why and how the East Harlem Health Center came into being. For one thing during this ten year period, 715,445 clients visited the health center, and going the other way, staff member visits to or on behalf of the residents of East Harlem

totaled 708,091. The total cost was $316,648 or 22 cents per visit if you want to put it that way. Consequently, or at least very largely so, all sorts of disagreeable mortality and morbidity rates decreased. W. W. PETER

Laboratory Manual, Methods of Analysis of Milk and Its Products—*Compiled by the International Association of Milk Dealers, 228 No. LaSalle Street, Chicago, Ill.* 461 pp. Price, $5.00 to public health officials, $7.50 regular price.

This book, or manual as it is properly called, is the result of two years of work by practical laboratory men who have assembled tests found most useful in the milk or ice cream plant laboratory. The five parts of the manual cover the following subjects: organization of a dairy laboratory; bacteriologic control methods; chemical and physical control methods for dairy products; bacteriologic, chemical and physical tests for non-dairy products; preparation of bacteriologic mediums, standard solutions, indicators, and a useful appendix of handy reference data.

This will prove useful to milk plants which have or are contemplating the development of laboratories, to public health laboratories, and to colleges where instruction is given in dairy methods. A prospectus has been prepared which will be furnished upon request by the Association.

IRA V. HISCOCK

Improvised Equipment in the Home Care of the Sick—*By Lyla M. Olson, R.N. (2d ed.) Philadelphia: W. B. Saunders Company,* 1933. 197 pp. Price, $1.25.

This is an entirely new revision of Miss Olson's work, first published in 1928. This is small and compact, containing 197 pages and a total of 285 illustrations. The contents of the 60 chapters are well indexed thus making it very convenient as a reference book.

The subject matter covers every type of appliance and equipment that a nurse might find herself in need of and may not have at hand. The directions for improvising and the many illustrations provide means whereby any nurse can create the equipment she needs. The so often heard and probably just criticism, that a nurse in the home so often requires so many things that she becomes an expense account could somewhat be eradicated if every student nurse became familiar with this book. The suggestions given could also be adapted to the smaller hospitals which do not have finances for expensive equipment.

This book is a fine contribution to nursing education. Public health nurses especially will find it very useful, since their field of work is the home. They will also find that the content would make valuable material for staff education and demonstrations.

However, every nurse, regardless of her type of nursing, will find it very useful and as stated by Clara D. Noyes, National Director of American Red Cross Nursing Service, in her foreword, "We hope, therefore, that this little book finds its way into the schools of nursing of this country and that the students become familiar with its contents before they embark upon their careers." FLORENCE E. SPAULDING

A General History of Nursing—*By Lucy Ridgely Seymer. New York: Macmillan,* 1933. 317 pp. Price, $2.75.

Instructors of Nursing and students will find that this book contains very definite and dependable information on the history of all types of nursing and nursing organizations. The bibliography shows rare judgment in the selection of material from many sources which gives continuity to the historical data. The book is written in a simple,

straightforward manner with a depth of feeling which inspires one with a desire to cherish each historical event.

The author, appreciating the value of state, national, and international nursing organizations, conveys to the reader very definitely the assistance rendered nurses by their professional affiliations. The graduate will find here much material for refreshing her memory in the history of nursing.

RUBY ROGERS

Hospitals and Child Health—*White House Conference on Child Health and Protection. New York: Century,* 1932. 279 pp. Price, $2.50.

This book is a splendid report. It is an informative study of what the hospitals are doing for the health and protection of children. The study is divided into three parts:

1. *Hospitals and Dispensaries*—The survey showed that enough beds are available for the care of white children in hospitals but care of colored children is woefully inadequate. The beds for children are not controlled definitely by a pediatric staff. Special internships in pediatrics are few, and the training of nurses in pediatric wards is inadequate. "While the general surgical and medical conditions are well looked after, the care of mental and venereal conditions are not provided for as they should be."

2. *Convalescent Care*—(A) *What is being done:* During 1929, 22,141 children were cared for in convalescent homes, 27 per cent of these homes being affiliated with hospitals. Facilities for the care of the convalescent negro children are not adequate. (B) *What should be done:* There should be more facilities for the care of the convalescent negro and specialized cases in general. The sub-committee gives exhaustive conclusions and recommendations.

3. *Medical Social Service* — (1) There are 554 social service departments in hospitals and dispensaries of this country. (2) Application of tests to the service now being rendered through social service in medical institutions. Medical social service in the protection of the child and his health must go beyond the child patient, for disease and social difficulties of parents and older members of the family may bear heavily on the child. A total of 1,389 placements in foster homes were made by 153 medical social service departments in 68 cities. (3) The lines along which activities of medical social service should be encouraged are covered well in a section on conclusions and recommendations.

ELDRED V. THIEHOFF

The Rise of Preventive Medicine—*By Sir George Newman, M.D. London: Oxford University Press,* 1932. 270 pp. Price, $3.00.

This book is made up of the Heath Clark Lectures, 1931, delivered at the London School of Hygiene and Tropical Medicine, the first series given under this bequest. We have often had occasion to speak of the facility and knowledge with which Sir George Newman writes on matters of public health, and it is needless to add that no man could be found better fitted to inaugurate this series of lectures than himself.

Beginning with folk-lore, magic, custom and religion, the author carries us through the development of preventive medicine, which of course includes much of general medicine, physiology and other cognate sciences, down to the present, concluding with a chapter on the collective and communal organization of preventive medicine. Each chapter is preceded by a synopsis. The book as a whole shows an enormous amount of study. It contains many statements, some quoted, and some original, which can well serve as aphorisms. The author considers that the bedrock principle of preventive medicine is anchored in anthropology.

the science of the biological history of man; and holds that folk-lore and magic formed the beginning of the science and art of medicine, in which he agrees with Sir Clifford Allbutt.

Needless to say, Egypt comes in for considerable attention, as it was the focal point at which various civilizations were centered and where cross-fertilization took place. The medicine of that country was a palimpsest of medical learning, though needless to say, it was very much mixed with superstition, demonological lore, and other ideas which blocked progress to a greater or lesser extent. Moses was "learned in all the wisdom of the Egyptians," and almost the first organized documents concerning medicine are contained in what is known as the Mosaic Law. It is Mosaic in origin and texture, the author says, but was formulated between 1400 and 1250 B.C., its earliest records having been written in the 10th or 9th Century by some prophet of Judah, and cast into one form somewhere about 722 B.C. None of the constituent documents were written by Moses, though what he said to the children of Israel might well have been their origin and inspiration. A review of the 8 points made in this Law will convince anyone of its value, and Sudhoff said: "Had Judaism given nothing more to mankind than the establishment of a weekly day of rest, we should still be forced to proclaim her one of the greatest benefactors of humanity."

Greece also comes in for serious consideration, and concerning the Greek spirit, Sudhoff is quoted as saying: "It first clearly grasped the aims and inwardness of hygiene." Drainage for malaria was proposed in this country between 500 and 430 B.C. by Empedocles, "a physician with a practical sense of prevention." All students of medicine recognize how much we owe to the Greeks. Sir Clifford Allbutt summarized this: "There were for the wiser Greek physician three factors of safety: he was free from magic, he never forgot to treat the individual, he was a master of hygiene."

One is tempted to keep on giving quotations from this excellent presentation, containing much that has been known and forgotten by some and new to many. The author holds that nothing educates people more than sanitation, and stresses preventive medicine in action as an educator of the public, saying that he has known the purification of a water supply in a village to raise the moral standards of the community.

Sir John Simon says of preventive medicine, "It is the province where Medicine joins hands with Common Sense." The last chapter ends by following this great pioneer in urging reliance on the strength of the people for self-help and upon the solicitude of the community for the welfare of its weaker members. "Altruism and kindliness of man to man, combined with foresight, true economy and common sense are among the forces which can most wisely apply the verities of the science and art of Preventive Medicine to the needs of men."

This is the most ambitious work which the author has published. Every page is full of meat. The illustrations are fine, and we wish that more pictures of pioneers in preventive medicine might have been given us.

The printing and make-up are what we have learned to expect from the Oxford Press. It is a matter of some regret that although these lectures were given in 1931, they appeared in print late in 1932, and have been received in this country in 1933. There are few books on public health which can be recommended more heartily and completely than this.

MAZŸCK P. RAVENEL, M.D.

General Principles Governing the Prevention of Tuberculosis—*By Dr. E. Burnet. Geneva: Quarterly Bulletin of the Health Organization, League of Nations. Distributed in the United States through the World Peace Foundation, Boston, December,* 1932. 174 pp.

This very comprehensive report is a result of two years of work on the part of Dr. Burnet, who was secretary of a "Reporting Committee" appointed by the Health Committee of the League of Nations to report on the question of tuberculosis control throughout the world.

Dr. Burnet not only drew on articles already prepared, but conducted field studies in Germany, Austria, Denmark, France, Great Britain, Italy, The Netherlands, and Yugoslavia. Unfortunately for the readers in the United States, very little is said about the tuberculosis program in this country or Canada. Dr. Burnet explains this by saying that he had "no direct knowledge of Canada or the United States of America, or of Japan or Russia." However, he says that his intention is not to present a complete picture, but rather to lay down the general lines for efficient organization.

The first premise is that tuberculosis is a "social disease" the control of which is to be effected fundamentally by organized community activity, or what is commonly known in Europe as "social hygiene." It is impossible in a brief review of this sort to state the facts upon which he bases this premise. However, he discusses the decline in the tuberculosis mortality, the reasons for that decline and the social factors which underlie it. His contention is that the decrease in the tuberculosis death rate is a matter primarily of progress in civilization which includes improvements in all social factors plus specific anti-tuberculosis measures undertaken in the various countries.

Concerning these specific measures, Dr. Burnet feels that the dispensary is the important and pivotal agency in the campaign against tuberculosis and that it should become more and more a central clearing place through which all tuberculous persons should pass, and be directed to the care and treatment which is best suited to each case. He feels that the dispensary should not only take cases which come to it, but should go out and seek the people who need care, putting on, if necessary, a thorough case-finding study.

Dr. Burnet traces the revolution which is taking place in sanatoria. At first they were only places where persons suffering from tuberculosis were kept from infecting others. Then came the realization that along with the practice of collapse therapy the sanatoria could become hospitals and great strides made in the curing of tuberculosis in them. The third step was to make the sanatoria great centers from both the medical and preventive points of view, valuable both to the individual and the community. He calls this revolution the "hospitalization of sanatoria."

As to the results of collapse therapy, the author is none too sanguine. He feels that much of this work could be done in dispensaries and that thereby the dispensary could be a center for epidemiological research. He stresses the importance of the nurse in the scheme of tuberculosis control, and discusses the rehabilitation and after care which he feels must be linked up with sanatoria. In this connection he advocates that villages be built around sanatoria for ex-patients which shall serve as health centers.

The author finds that the experiments with BCG throughout the world point to favorable results and ventures the thought that as the years go by greater use will be made of it.

The entire question of bovine tuber-

culosis is discussed, based on studies in several countries. He quotes from Möllers that, "The proportion of bovine bacillus infection to all cases of human tuberculosis is 2.8 per cent" and suggests that it will be wise to abide by the conclusions adopted at the 1912 Rome Congress: "The infection of human beings by the bovine bacillus is much less frequent than their infection with the human bacillus. At the same time the measures recommended against infection by the bovine bacillus should be maintained."

In Part III, the author discusses the political and administrative framework in all the countries under discussion. The first sentence of this section is as follows: "The history of the campaign against tuberculosis shows that the first action was taken by private organizations. The State intervened later on to support and regulate this action." And again, "In no nation has the State directly completely taken over the campaign against tuberculosis." . . . "Private initiative can never be sufficiently far-reaching, methodical or generous to conduct the campaign against tuberculosis single-handed." The question of health insurance as practiced in the various countries is exhaustively discussed.

The fourth section covers the cost of tuberculosis work in the various countries studied. This is very enlightening and very valuable since it brings together for the first time definite figures concerning the amount spent for tuberculosis work.

In conclusion, the author brings together the principles of prophylaxis and gives in fairly brief space the implications of a complete tuberculosis program. One or two quotations are significant: "Tuberculosis is not the only endemic or epidemic disease from which mankind is suffering, but it is the most difficult to eradicate, and on it hygiene will therefore test its power. If a man can conquer tuberculosis, he will be able to rid himself of the other ills which beset him. The struggle with tuberculosis will be the supreme test of social hygiene."

The reader of this article will learn nothing regarding the tuberculosis program in this country, but he will grasp the fundamentals of tuberculosis control as practiced throughout the world and will feel the trends of that work from an international standpoint. It is a remarkable article and a very important résumé to date of tuberculosis work. JESSAMINE WHITNEY

The Vitamins in Health and Disease —*By Barnett Sure, Ph.D. Baltimore: Williams & Wilkins,* 1933. 206 pp. Price, $2.00.

"New discoveries," wrote Dr. Harvey Cushing of medical science in the latter part of the nineteenth century, "were being announced like corn popping in a pan." Much the same condition exists today with respect to research on the vitamins. Results of investigations on these formerly elusive substances are reported so frequently and extensively that the bio-chemists themselves are somewhat bewildered by them. Sanitarians and physicians, who have many things to ponder over, often find it virtually impossible to keep up with the latest important developments in nutritional science.

This book, prepared by an authority in this particular field, will be welcomed as a concise review of modern knowledge regarding the vitamins, which are conceded to be of vast significance to human health. The book is written in a simple style, with no attempt at dramatics. It will appeal to the intelligent rather than the average reader and it should prove of real interest and value to health workers. Occasionally the author has a tendency to indulge in speculation, but most of the material is strictly factual. Like all of the books

issued by this publisher, it is exceptionally well printed. There is a brief foreword by Dr. Walter H. Eddy, whose recommendation of the text to all interested in the relation of diet to health can be seconded by the reviewer.

JAMES A. TOBEY

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Another Glance at the Wages of Diphtheria Prophylaxis—Diphtheria immunizationists will find comfort in the annual tabulation of results, for those cities doing the best work in prophylaxis are, in general, enjoying the lowest mortality rates. Diphtheria is relatively most prevalent in the Southwest which formerly had lower rates than the rest of the country.

ANON. Diphtheria Mortality in Large Cities of the United States in 1932. J.A.M.A. 100, 20:1595 (May 20), 1933.

Typhoid Fever Drops Again—The annual summary of typhoid rates in the large cities concludes with: "Whatever the case as regards rural communities and the smaller cities, it is evident, now that the returns are all in, that the larger cities of the United States experienced no increase in typhoid mortality in 1932 but, instead, a substantial reduction."

ANON. Typhoid in the Large Cities of the United States in 1932. J.A.M.A. 100, 19: 1491 (May 13), 1933.

More About Rheumatism—One would suppose that the subject of rheumatism had been pretty effectually explored, but here is another British symposium which works over again the old familiar sod. Included as usual are the health, economic, social and industrial aspects.

BROWN, W. L., *et al.* Rheumatism and Arthritis as a Public Health Problem. J. State Med. 41, 5:250 (May), 1933.

Pointed Aesculapian Philosophy—Much that will give pause to the ardent proponent of preventive medicine will be found in this scholarly dissertation on the philosophy of medical practice. The author pays his respects to the well known Committee on Costs with some delightful banter. Good for all to read.

CUSHING, H. Medicine at the Crossroads. J.A.M.A. 100, 20:1567 (May 20), 1933.

Who Shall Practice Public Hygiene?—Shall educational qualifications for health workers be set up and, if so, who and what shall qualify candidates? These questions are posed but not fully answered in hope that the discussion provoked may bring us one step nearer the solution of this difficult matter.

FERRELL, J. A. Professionalization in Public Health Work. J.A.M.A. 100, 18:1380 (May 6), 1933.

A Doctor Looks at the Baby Clinic—No one doubts the educational value of infant welfare clinics; all know that they help mothers who can afford to pay, says the author. What's the answer? "If a mother knows that her private doctor has a systematized plan of following her child and that he is really interested," she will come to his office by appointment rather than wait "half the afternoon with a swarm of other women and contagious children." After that, there follows some searching

criticism of present conditions in practice.

HILL, L. W. Child Health Conferences and the Doctor's Bread and Butter. New Eng. J. Med. 208, 18:942 (May 4), 1933.

Looking for Abortive Poliomyelitis—Methods for the detection of abortive cases are discussed, and the records are made of five small community outbreaks. Clinical poliomyelitis is probably four times as frequent as usual statistics indicate.

PAUL, J. R., *et al.* Studies on the Epidemiology of Poliomyelitis. **Am. J. Hyg. 17,** 3:587 (May), 1933.

Southern Contributors to Public Hygiene—Brief biographies of the leaders in public health who came from, or did their work in, the Southern states. This will furnish useful material for the historically-minded sanitarian.

LEATHERS, W. S. Pioneers in Public Health In the Southern United States. South. M. J. 26, 4:306 (April), 1933.

Foreign Views of Our American Diphtheria Propaganda—"We in this country (Great Britain) are apt to look askance at the flamboyant methods of propaganda used by our brethren on the American continent. . . . The time has come, however, when in the light of results achieved we *must* doff the cloak of ultra-respectability and tackle the job on the lines of the American merchant who, having goods to sell, finds that publicity pays." These sage comments are interlarded in a comparison of British and American methods and results.

NASH, E. H. T., and FORBES, J. G. Diphtheria Immunization: Its Possibilities and Difficulties. Pub. Health 46, 8:245 (May), 1933.

Colds by the Boat Load—Another study of colds in an isolated Arctic community reveals the same findings as earlier research. About 48 hours after the first boat in spring, an outbreak of colds begins which eventually includes most of the inhabitants who remain free from colds during the season in which there is no communication with the outside world. None of the organisms of the usual nasal flora seemed important.

PAUL, J. H., and FREEZE, H. L. An Epidemiological and Bacteriological Study of the "Common Cold" in an Isolated Arctic Community (Spitzbergen). Am. J. Hyg. 17, 3:517 (May), 1933.

NEWS FROM THE FIELD

SEPTEMBER 1932 AND JANUARY 1933 JOURNALS NEEDED

DUE to unusual demands for last year's September number and this year's January number of the Journal, the Executive Office finds itself in need of several copies of each issue. It would be greatly appreciated if members who can spare these Journals would send them to headquarters. Each member who complies with this request will be reimbursed for the postage used.

DR. RICE AND DR. RUHLAND SAIL

AMONG the 17 guests of the Oberlaender Trust who sailed last month for a six-month study of cities in Germany were Dr. John L. Rice, Health Officer of New Haven, Conn., and Dr. George C. Ruhland, Commissioner of Health of Syracuse, N. Y., both Fellows of the A.P.H.A.

JOURNALS MERGE

THE journals *Archives of Physical Therapy, X-Ray,* and *Radium* and *Physical Therapeutics* have consolidated, retaining the name of the former. These journals were the official organs of the American Congress of Physical Therapy and the American Physical Therapy Association, respectively. The merging of the journals is the result of the amalgamation of the two organizations into the American Congress of Physical Therapy.

HOMER FOLKS GIVES DELTA OMEGA LECTURE AT YALE

THE 1933 Delta Omega lecture at Yale University was given on April 24 by the Hon. Homer Folks, of New York, Fellow A.P.H.A. His subject was " Public Health and Social Service."

GERMAN GOVERNMENT AID FOR SMALL-SCALE GARDENING

THE Federal Government of Germany, which for the last year or two has been aiding the unemployed to establish small gardens, has recently provided another 25 million Reichsmark (about $6,000,000) for that purpose. Out of this amount loans will be made to communities which in their turn will lend to individuals small amounts, 50–70 Reichsmark (about $10–17), without interest, to be paid within 10 years. A community is entitled to a loan when it intends to establish a minimum of 20 gardens. The ground for each garden must be of a certain size and is to be selected with a view to the possibility of later adding a house to it.—*Archiv f. Soziale Hygiene und Demographie,* Berlin, Dec., 7, 6, 1932.

STATE CHARITIES AID CELEBRATES

THE Silver Anniversary Annual Conference of State and Local Tuberculosis and Public Health Committees of the State Charities Aid Association was held in New York City June 8–9, in celebration of the twenty-fifth anniversary of the anti-tuberculosis campaign in New York State, outside of New York City, carried on by the State Department of Health and the State Charities Aid Association.

DR. LUEDDE AWARDED BLINDNESS PREVENTION MEDAL

THE Leslie Dana Gold Medal, awarded annually for the most outstanding achievements in the prevention of blindness and the conservation of vision, was presented to Dr. William H. Luedde, Director of the

Department of Ophthalmology at the St. Louis University School of Medicine.

Dr. Luedde was selected for this honor by the National Society for the Prevention of Blindness in coöperation with the Missouri Association for the Blind, through whom the medal is offered annually by Mr. Leslie Dana of St. Louis.

NEW POSITION CREATED IN BALTIMORE

DR. ANTHONY L. RETTALIATA has been appointed Full-Time Medical Health Officer of the Baltimore Health Department. This is a newly created position in the Department.

NEW BUTTER RULING IN CINCINNATI

THE Board of Health of the City of Cincinnati has adopted a regulation which requires that all butter sold in Cincinnati shall be made of cream from tuberculin tested cows in officially accredited areas, and that certification to this effect shall appear upon the label. This regulation will become effective September 1, 1933.

EXTENSION COURSE AT ALBANY MEDICAL COLLEGE

THE Albany Medical College, in coöperation with the New York State Department of Health, devoted "Residence Week"—June 12–17—to an extension course for Health Officers.

The program included papers on epidemiological work, medical care of indigents during the present emergency, newer diagnostic criteria of tuberculosis, typhoid carrier control, water supplies and summer camps, milk control in New York State, childbirth mortality, orthopedic service of the New York State Department of Health, and a symposium on the venereal diseases. Also there were clinics on heart diseases, industrial surgery, syphilis, and undulant fever.

THE BLIND IN PALESTINE

THE British Government is criticized for its indifference toward the blind of Palestine in a report by Subhi Dajani, of Jerusalem, published in the June issue of the quarterly journal of the American Braille Press, international organization which produces and distributes literature and music in raised print for the blind.

"The Government has so far provided no legislation for the relief of the blind. . . . There are three institutions which care for the education of the blind, though not exclusively. The best is the Jewish Institute for the Blind, which is entirely for Jews. The Syrian Orphanage devotes part of its buildings to the housing and education of the non-seeing, and finally there is a Moslem Orphanage. The number of blind in these establishments . . . is 190. . . . The total number of blind in Palestine is given as 5,000, though this does not include the sightless village populations. . . . most of the Moslem blind earn their living by reading the Koran after the dead. The streets abound with blind beggars."

SCIENTIFIC CRIME DETECTION COURSE

NEW YORK UNIVERSITY has announced the establishment of a department of Forensic Medicine at the University and Bellevue Hospital Medical College, to train medical examiners and toxicologists. The new department, one of the first of its kind in this country, is designed as an initial step towards establishing a system of scientific crime detection in this country which may some day rank with the system of medico-legal institutes of Europe.

Dr. Charles Norris, chief medical examiner of the City of New York, has been named Professor of Forensic Medicine and will head the department.

RESOLUTIONS ADOPTED AT THE FOURTH ANNUAL CONVENTION OF THE WESTERN BRANCH, AMERICAN PUBLIC HEALTH ASSOCIATION, PASADENA, CALIF., MAY 29–31

RESOLUTION I

WHEREAS: for many years past in this country the mortality and morbidity from preventable causes among the rural populations has remained stationary and exceeded that of the urban population, and

WHEREAS: numerous surveys including that of the New York State Health Commission, show a lack of coordinated and sustained effort to remedy these deplorable conditions in rural areas, and

WHEREAS: the only effort being made in such areas is an appropriation by the Federal Government through the United States Public Health Service and the appropriation of a few national private agencies, thus stimulating states and a number of counties to support rural health departments, and

WHEREAS: as a result of such expenditures in rural areas a material reduction in mortality and morbidity rates has occurred in these areas, and

WHEREAS: in the absence of such aid under present rural economic conditions many such efforts will be discontinued, and

WHEREAS: the need of such effort is particularly urgent in the Western states because of the likelihood of introduction of oriental diseases, and

WHEREAS: it has been the policy of the Federal Government to assist states and local communities in rehabilitation programs, and

WHEREAS: the foundation of these rehabilitation programs is the preservation of the public health,

NOW THEREFORE BE IT RESOLVED: the Western Branch, American Public Health Association in regular annual meeting at Pasadena, Calif., on May 30, 1933, respectfully petitions that the Federal Government continue to recognize this responsibility by the appropriation of adequate funds for full-time county health units and rural sanitation.

RESOLUTION II

WHEREAS: the recent appearance of psittacosis in California and other Western states has established this disease as a distinct menace to the public health, and

WHEREAS: scientific investigations have proved that birds of the psittacine family, particularly parrakeets in California, are infected with this disease, and

WHEREAS: intensive research into psittacosis among psittacine birds in California together with the enforcement of adequate regulations governing the importation of such birds into the United States should necessitate stringent measures in the control of this disease, and

WHEREAS: the United States Public Health Service is rendering invaluable assistance to California and to all other states through the maintenance of its local laboratory for the study of psittacosis and through the enforcement of regulations governing the importation of psittacine birds,

NOW THEREFORE BE IT RESOLVED: that the Western Branch of the American Public Health Association request the United States Public Health Service to continue the maintenance of its laboratory for the study of psittacosis in California, and

BE IT FURTHER RESOLVED, that the United States Public Health Service be requested to take all necessary

precautions to prevent the introduction of psittacine birds into the United States, and

BE IT FURTHER RESOLVED, that these resolutions be spread upon the minutes of the Association and that a copy be sent to the Surgeon General of the United States Public Health Service.

RESOLUTION III

WHEREAS: the Western Branch of the American Public Health Association realizes that, in this period of financial emergency when there is an unusual amount of personal distress and civic unrest, a great effort must be made to maintain the physical well-being of our citizens, most particularly the children, so that the communities may not be endangered by epidemics of communicable disease brought about by malnutrition and bad housing, and

WHEREAS: the Health Departments and their allied health and social agencies of the various communities are charged with the responsibility of maintaining the health and welfare of the citizens and must of necessity, meet the increasing demands brought about by these unusual times,

NOW THEREFORE BE IT RESOLVED: that the Western Branch of the American Public Health Association emphasize to our legislative representatives and various governing boards, the grave emergency that is now being faced by Health Departments and ask their continued and increasing support both morally and financially, and

BE IT FURTHER RESOLVED: that copies of this resolution be sent to the representatives of the above bodies.

RESOLUTION IV

WHEREAS: economic conditions are such as to necessitate maximum efficiency in governmental activities, and

WHEREAS: many of the National Public Health Agencies will upon invitation, assign experts to state and local authorities for the purpose of surveying conditions and making recommendations as to the type of public health organization needed to obtain maximum results with the funds available,

NOW THEREFORE BE IT RESOLVED: that the Western Branch of the American Public Health Association in Annual Meeting at Pasadena, California, May 29, 30, and 31, 1933, bring to the attention of the proper state and local officials in their territory the necessity of this service, the advisability of this service and assist them upon request in contacting proper officials.

RESOLUTION V

WHEREAS: the Colorado Medical Association and the Denver Health Council have sponsored a statewide public health survey by the United States Public Health Service and have initiated legislation designed to improve public health activities throughout Colorado,

NOW THEREFORE BE IT RESOLVED, that the Western Branch of the American Public Health Association commends the actions of the above organizations, and we recommend similar programs for the other Western states.

RESOLUTION VI

WHEREAS: one of the major benefits of national conventions of the American Public Health Association is the activated interest in public health, developed in sections fortunate enough to be hosts to the convention, and

WHEREAS: allocation to some Western portion of the United States is contemplated for the convention next year,

NOW THEREFORE BE IT RESOLVED: by the Western Branch, American Public Health Association in its Fourth Annual Convention assembled, that we join the many public health, medical, and civic organizations in cordially inviting the American Public Health Association to hold its 1934 Convention in Southern California.

SEWAGE ASSOCIATION MEETS AT ROCHESTER

THE Spring meeting of the New York State Sewage Works Association was held at Rochester, N. Y., June 9–10. Papers were presented—on Vacuum Filtration of Sewage, Sewage Aeration, Selection and Maintenance of Mechanical Sewage Equipment—and so on. There was a symposium on Small Sewerage Systems and Treatment Plants.

PERSONALS

H. GRADY CALLISON, M.D., member A.P.H.A., has been elected Commissioner of Health of Richmond County, Ga., with department of health headquarters at Augusta. He succeeds Dr. Eugene E. Murphey, member A.P.H.A., who has retired. Dr. Callison had been Deputy Commissioner of Health for a year, having formerly been Health Officer of Newberry County, S. Car.

DR. ANTHONY J. LANZA, F.A.P.H.A., spoke on "Silicosis in the United States" at a meeting on silicosis held in Chicago June 12, under the auspices of the industrial committee of the Chicago Tuberculosis Institute.

DR. JOHN H. GRAVES, member A.P.H.A., President of the California State Board of Health, was recently appointed medical director of the California State Industrial Accident Commission and State Compensation Insurance Fund.

DR. ADDISON W. PRESTON, of Visalia, has resigned as Health Officer of Tulare County, Calif., after 25 years' service.

DR. RAY C. ATKINSON has been appointed Health Officer of Colfax, Calif., succeeding Dr. David M. Kindopp.

DR. GARLAND H. PAGE, of Salt Lake City, Utah, member A.P.H.A., has been appointed Superintendent of the Utah State Hospital, at Provo.

DR. OSWALD T. AVERY, of New York, member A.P.H.A., has been named President of the American Association of Pathologists and Bacteriologists.

RICHARD A. BOLT, M.D., F.A.P.H.A., has been appointed by the United States State Department as a delegate to the Sixth English-Speaking Conference on Maternity and Child Welfare, to be held in London July 5–7, and also to the Congrès International pour la Protection de l'Enfance in Paris immediately following. Dr. Bolt is making a study of maternal and child welfare conditions in Germany and Austria, as a result of a recent award of the Oberlaender Trust.

DR. JOHN H. HAMILTON, F.A.P.H.A., was recently appointed Director of the North Carolina State Laboratory of Hygiene, at Raleigh, N. C. He succeeds the late Dr. C. A. Shore.

CONFERENCES

June 28–July 3, International Hospital Congress, Knocke-sur-Mer, Belgium.

July 1–7, National Education Association, Chicago.

July 3–7, Association for Childhood Education, Denver, Colo.

July 3–8, British Social Hygiene Council Imperial Congress, London.

July 4, Meeting of the Department of Lip Reading of the National Education Association, Chicago, Ill.

July 5–7, Sixth English-Speaking Conference on Maternity and Child Welfare, London.

July 5–9, International Union of the Protection of Childhood, Paris.

July 10–15, International Council of Nurses, Paris, July 10–12; Brussels, July 13–15.

July 18–20, International Congress of Pediatrics, London.

July 19–22, International Society of Orthopoedic Surgery, London.

July 25–29, British Medical Association, Dublin.

July 29–August 4, World Federation of Education Associations, Dublin.

August, World Federation of Education Associations, Dublin.

September 27–28, Second European Reunion on Mental Hygiene, Rome.

November, 7th American Scientific Congress, Mexico City.

Spring, 1934, Statistical Conference, International Statistical Institute, London.

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BACTERIOLOGISTS

Bacteriologist, with fourteen years' experience as assistant director of state public health laboratories, desires an immediate position either in public health, commercial work, or teaching. Has had experience in teaching and public health education. L.L. 540

Bacteriologist, M.S. in Bacteriology and Clinical Diagnosis, University of Washington, Seattle; laboratory experience in private clinical laboratory, State Health Department laboratory, hospital laboratory and in milk research with the U. S. Public Health Service. Available now. 65

Young man desires position as director of laboratory or teaching bacteriology; Ph.D., Cornell University, 1924; teaching experience at Cornell, '17–'24, at Harvard, '24–'26; considerable experience as technician, chemist and director of hospital laboratory. Available now. 66

Young woman, nurse's training, Düsseldorf, Germany; laboratory and X-ray course, North West Institute, Minneapolis; one and one-half years' experience in large city health department, desires position, preferably in the South. 67

HEALTH OFFICERS

Physician desires position as director of health in a city or rural district. Four years' special training at Beiruth, Syria, and a course at New York University; four years' experience as County Health Officer. Available now. 68

Young man, M.D., University of Louisville; C.P.H., Johns Hopkins; desires position as City or County Health Officer; one year's experience with county Health Department and three years' experience as city Health Officer. Available now. 69

Physician, M.D., Northwestern University, special course in business administration, desires position as city Health Officer. Served as industrial physician in steel company; has had two years' experience as city Health Officer. Prefers West or South. Available on six weeks' notice. 70

Physician, graduate of Class A medical college, desires position in public health work. Has had eight years' experience in city and rural health work and sanitation. Available, with reasonable notice, at any time. H.M.B. 72

SANITARY ENGINEER

Young man, S.B. in Sanitary Engineering, Massachusetts Institute of Technology; graduate work, University of Arizona in physiology, advanced bacteriology and organic chemistry; Assistant Water Superintendent and Engineer for a local Health Department and considerable experience as civil engineer on road and dam construction. 71

MEDICAL BUREAU

The Medical Bureau has available class A physicians, dentists, graduate nurses and laboratory workers who have specialized in public health work. All credentials have been thoroughly investigated. Those in need of such personnel may receive complete biographies including statements regarding candidates' ability, integrity, and responsibility. No charge to employers for the introduction of applicants. M. Burneice Larson, Director, The Medical Bureau, Pittsfield Building, Chicago.

POSITIONS AVAILABLE

The next examination for Registered Pharmacists to be conducted by the New Jersey Board of Pharmacy will be held at the State House, Trenton, N. J., Thursday, October 19, 1933. Applicants for this examination must have all papers on file not later than September 19, 1933. Requests for application blanks should be sent to the Board of Pharmacy, State of New Jersey, 28 West State Street, Trenton, N. J.